

## **SURVEY OF SOME ENTOMOLOGICAL PARASITIDS AND PREDATORS ATTACKING FRUIT AND WOOD TREE BORERS IN EGYPT**

**BATT, A. M.**

*Plant Protection Research Institute, ARC, Egypt*

(Manuscript received 18 October 2005)

### **Abstract**

This survey of the entomological parasitoids and predators attacking the borers infesting fruit and wood trees is the pioneer in Egypt. Thirty one species of parasitoids belonged to 9 families of order Hymenoptera and one family of order Coleoptera, besides 18 species of predators belonged to 4 families of order Coleoptera were recorded. These parasitoids and predators were detected on some wood-boring insects which belonged to 6 Coleopterous families (Scolytidae, Buprestidae, Cerambycidae, Bostrychidae, Ahobiidae and Lyctidae). Recorded families of parasitoids were Pteromalidae (6 species), Eurytomidae (2 species), Eupelmidae (one species) Chalcididae (5 species), Eulophidae (one species), Bethyidae (3species), Ichneumonidae (3 species), Braconidae (8 species), Sclerobigidae (one species) and Dermestidae (one species), while the recorded families of predators were Cleridae (11 species), Histeridae (5 species), Dasytidae (one species) and Tenebrionidae (one species). This paper included both the host borer and host plant, besides, some observations on certain parasitic and predaceous insects.

### **INTRODUCTION**

Biological control is one of the important methods that must be considered in any integrated control program.

Parasitoids and predators are the principal agents and limiting biotic mortality factors affecting the pest population densities from attaining economic injury levels

To date, the survey of the Egyptian entomological fauna concerning the parasitoids and predators attacking the fruit and wood tree borers is lacking. However, some investigators (Willcocks, 1924, Alfieri, 1976, Helal and Sebay, 1980, Abd- Allah, 1983, Ismail et al., 1988, Abd -Allah and Tadros, 1987, Girgis et al, 1991, Okil , 1991, Batt, 1998, 1999a, 1999b, 2002, 2004, El-Aakkad and Batt, 2003, El-Akkad, 2003) gave some information about the parasitoids and predators on some borers.

Therefore, this work was carried out to contribute towards the record of parasitoids and predators attacking different borers of fruit and wood trees. Such survey may form a good basic for further researches help implementing a better management of target borers.

## MATERIALS AND METHODS

Infested samples with different wood – boring insects were collected from various parts (roots, trunks and branches) of fruit and wood trees at some localities of the most Egyptian Governorates comprising lower Egypt, upper Egypt and Sinai during four years. Samples of each host plant / borer were put separated in plastic or glass containers. Weekly observation was made. Beetles, parasitoids and predators emerging from each host were collected. Internal stages of different insects inside woods were observed by removing the bark above some borers and by breaking or splitting the wood to reach the larval tunnels and pupal chambers of other borers. The collected parasitoids and predators were classified. Unknown specimens were identified by specialized researchers at Classification Division of Plant Protection Research Institute (PPRI) and Systemic Entomology Laboratory (SEL), Agricultural Research Service, US Department of Agriculture (USDA). Host borers, host plants and some observations were illustrated.

## RESULTS AND DISCUSSION

### I. Survey of parasitoids:

Data presented in Table 1 indicated that 31 species of parasitoids that belonged to 9 families of order Hymenoptera and one family of order Coleoptera were recorded on some wood – boring insects which fall into 6 Coleopterous families (Scolytidae, Buprestidae, Cerambycidae, Bostrychidae, Anobiidae and Lyctidae). These parasitoids were as follows: (\*: indication to new record).

#### A. Hymenopterous parasitoids:

##### a. Super family: Chalcidoidea (14 species)

#### I. Family: Pteromalidae (6 species)

- 1- *Rhaphitelus maculatus* Walk.
- 2- *Cerocephala cornigera* West.
- 3- *Cerocephala eccoptogastris* Masi \*
- 4- *Cheiopachus quadrum* L.
- 5- *Cheiopachus colon* L.
- 6- *Callimomoides* sp. (subfam. Louriciinae\*)

#### II. Family : Eurytomidae (subfam. Eurytominae) (2 species)

- 7- *Eurytoma morio* Boh. \*
- 8- *Exeurytoma* sp\*.

#### III. Family: Eupelmidae (one species)

- 9- *Eupelmus* sp.

**IV. Family: Chalcididae (5 species)**

- 10- *Tanycorphes* sp.
- 11- *Brachymeria minuta* L. (subfam. Brachymeriinae)
- 12- *Leucospis* sp\*.
- 13- *Cratocentrus* sp.
- 14- *Theocolax formiciformis* West.\*

**V. Family: Eulophidae (one species)**

- 15- *Tetrastichus* sp.

**b. Super family: Bethyloidea (3 species)****I. Family: Bethylidae (3 species)**

- 16- *Cephalonomia hyalinipennis* Ashm.\*
- 17- *Cephalonomia mycetophila* Kieff.\*
- 18 - *Scleroderma domesticum* Latrei.

**c. Super family: Ichneumonoidea (11 species)****I. Family: Braconidae (8 species)**

- 19- *Habrobracon pectoralis* Wesm.
- 20- *Rhoptrocentrus piceus* Mars.
- 21- *Ecphylus hypothenemi* Ashm. \*
- 22- *Ecphylus* sp.\*
- 23- *Spathius exarator* L. \*
- 24- *Spathius* sp. \*
- 25- *Brachistes* sp.\*
- 26- *Dendrosoter protuberan* Nees\*.

**II. Family: Ichneumonidae (3 species)**

- 27 - *Ecrestis roborator* (subfam. pimplinae)
- 28- *Lemophaga forsteri* Isch ((subfam. Campopleginae)
- 29- *Synechocryptus (Cryptus)* sp\*. (subfam. Phygadeuontinae = cryptinae).

**d. Super family : Chrysididae (one species)****I. Family: Sclerobigidae\* (one species)**

- 30- unidentified

**B. Coleopterous parasitoids****I. Family: Dermestidae**

- 31- *Trogoderma granarius*

Table 1. Parasites attacking Coleopterous wood-boring insects.

Parasites		Host insect			
Family	No.	Scientific name	Family	Scientific name	Host plants
Pteromalidae	1	<i>Rhaphitelus maculatus</i> Walk.	Scolytidae	<i>Scolytus amygdali</i>	Peach, apricot, plum, pear & apple
	2	<i>Cerocephala cornigera</i> West.	Scolytidae	<i>Hypoborus ficus</i>	Fig
	3	<i>Cerocephala eccoptogastri</i> Masi		<i>S. amygdali</i>	Peach & apricot
	4	<i>Chelropachus quadrum</i> L.	Scolytidae	<i>Phloeotribus scarabaeoides</i>	Olive
	5	<i>Chelropachus colon</i> L.	Scolytidae	<i>S. amygdali</i>	Almond & peach
	6	<i>Callinomoides</i> sp.	Buprestidae	<i>S. amygdali</i>	Apricot & plum
Eurytomidae	7	<i>Eurytoma morio</i> Boh.	Scolytidae	<i>Ph. scarabaeoides</i>	Olive
	8	<i>Exeurytoma</i> sp.	Scolytidae	<i>Steraspis squamosa</i>	Tamarisk
	9	<i>Eupelmus</i> sp.	Scolytidae	<i>S. amygdali</i>	Peach, apricot & almond
	10	<i>Tanycorphes</i> sp.	Buprestidae	<i>Ph. scarabaeoides</i>	Olive
	11	<i>Brachymeria minuta</i>	Buprestidae	<i>S. amygdali</i>	Peach & apricot
	12	<i>Leucospis</i> sp.	Buprestidae	Hypoborus ficus	Fig
	13	<i>Cratocentrus</i> sp.	Buprestidae	S. amygdali	Almond
	14	<i>Theocolax formiciformis</i> west.	Anobidae	Chrysobothris dorsata	Mango & citrus
	15	<i>Tetrastichus</i> sp.	Lyctidae	Bellonota scutellaris	Mango
			Buprestidae	Sphenoptera trispinosa	Fig
		Buprestidae	Bellonota scutellaris	Mango	
		Buprestidae	Sphenoptera trispinosa	Fig	
		Lyctidae	Anobid spp.	Acacia	
		Buprestidae	Lyctus spp.	Acacia	
		Buprestidae	Agrilus lituratus	Acacia, plum & apricot	

Table 1. continued

Parasites		Host insect		Host plants	
Family	No.	Scientific name	Family		
	16	<i>Cephalonomia hyalipennis</i> Ashm.	Scolytidae	Peach & mango	
	17	<i>Cephalonomia mycetophila</i> Kieff.	Scolytidae	Peach & almond	
Bethyidae	18	<i>Scleroderma domesticum</i> Latrei.	Scolytidae	Plum & apricot	
			Lycidae	<i>Lyctus brunneus</i>	Lebbek & fig
				<i>Lyctus africanus</i>	Poinciana
				<i>Lyctus linearis</i>	Acacia
				<i>Phoracantha semipunctata</i>	Eucalyptus
				<i>Stromatium fulvum</i>	Casuarina & mulberry
		<i>Stromatium barbatum</i>		Sisso & casuarina	
		<i>Dinoderus minutus</i>		Bamboo	
		<i>E. obtusidentatus</i>		Eucalyptus	

Table 1. continued

Parasites		Host Insect		Host plants
Family	No.	Scientific name	Scientific name	
Braconidae	19	<i>Habrobracon pectoralis</i>	<i>Melanophila picta</i>	Willow & poplar
	20	<i>Rhoprocentrus piceus</i>	<i>Chrysobothris dorsata</i> <i>Capnodis carbonaria</i> <i>Beilonota scutellaris</i>	Peach Mango
	21	<i>Ephylius hypothenemi</i> Ashm	<i>Enneadesmus obtusidentatus</i>	Fig
	22	<i>Ephylius</i> sp.	<i>Hypothenemus</i> sp.	Mango & citrus
	23	<i>Spathius exarator</i> L.	<i>S. amygdali</i>	Plum & apricot
	24	<i>Spathius</i> sp.	<i>Ph. scarabaeoides</i>	Olive
	25	<i>Brachistes</i> sp.	<i>Anobiid</i> spp.	Acacia, fig & plum
	26	<i>Dendrosoter protuberan</i>	<i>Lyctus brunneus</i> .	Bamboo & lebbek
	27	<i>Ecrestis roborator</i>	<i>S. amygdali</i>	Pear
Ichneumonidae	28	<i>Lemphaga foisteri</i> Isch	<i>S. amygdali</i>	Plum & apricot
	29	<i>Synechocryptus</i> sp unidentified	<i>S. amygdali</i>	Apricot & peach
Sclerobigidae	30	<i>Trogoderma granarius</i>	<i>Chrysobothris dorsata</i>	Mango, citrus & apricot
	31	<i>Trogoderma granarius</i>	<i>Phoracantha semipunctata</i>	Eucalyptus
Dermestidae			<i>Stenaspis squamosa</i>	Tamarisk
			<i>Anathaxia angustipennis</i>	Peach, mango & acacia
			<i>Ph. semipunctata</i>	Eucalyptus

## II. Survey of predators

Data in Table 2 revealed that 18 species of predaceous insects grouped in 4 Coleopterous families attacked various species of wood-boring insects. These predators were as follows: (\*: indication to new record)

### A. Coleopterous predators

#### I. Family: Cleridae (11 species)

##### Subfam. : Tillinae

- 1- *Tillodenops bimaculatus* Sch. (*Cylidrus angustatus* Pic.)
- 2- *Cylidrus fasciatus* Cast.
- 3- *Denops albofasciatus* Charp.
- 4- *Paratillus carus* Newman.
- 5- *Eucymatodera senegalensis* Cast.

##### Subfam. : Hydnocerinae (=Phyllobaeninae)

- 6- *Emmepus bonnairei* Pic.

##### Subfam. : Tarsosteninae

- 7- *Tarsostenus univittatus* Rossi.

##### Subfam. : Clerinae

- 8- *Pholecopus andresi* Sch.
- 9- *Opilo barbarus* Abie.
- 10- *Opilo mollis* L\*.
- 11- *Thanasimodes gigas* Cast.

#### II. Family: Histeridae (5species)

- 12- *Teretrius acaciae* Rest.
- 13- *Teretrius kraetzi* Mars
- 14- *Teretrius pulex* Fairm.
- 15- *Platysoma castanipes* Mars.
- 16- *Platysma* sp.\*

#### III. Family: Dasytidae (one species)

- 17- *Dasytes* sp. \*

#### IV. Fam. Tenebrionidae (one species)

- 18- *Tenebrionodes mauritanicus* L.

Table 2. Predators attacking Coleopterous wood-boring insects.

Family	Predator		Host insect		Host plants
	No.	Scientific name	Family	Scientific name	
Cleridae	1	<i>Tilodenops bimaculatus</i> Sch.	Bostrychidae	<i>Dinoderus minutus</i> <i>Lyctus brunneus</i>	Bamboo & palm Acacia
	2	<i>Cylidrus fasciatus</i> Cast.	Bostrychidae	<i>Sinoxylon sudanicum</i> <i>Sinoxylon ceratoniae</i>	Lebbek, fig & mango Poinciana, acacia, sisso casuarinas & fig
	3	<i>Denops albofasciatus</i> Charp.	Bostrychidae	<i>Enneadesmus trispinosus</i> <i>E. obtusedentatus</i> <i>E. forficula</i>	Mango, palm, fig, Citrus & acacia
	4	<i>Paratillus carus</i> Newman.	Bostrychidae	<i>E. obtusedentatus</i>	Grapevine & mulberry
	5	<i>Eucymatodera senegalensis</i> Cast.	Cerambycidae	<i>Chlorophorus varius</i>	Peach & citrus
	6	<i>Emmepus bonnairi</i> Pic.	Bostrychidae	<i>Enneadesmus</i> spp. <i>Sinoxylon ceratoniae</i>	Sunt & poinciana
	7	<i>Tarsostenus univittatus</i> Rossi.	Bostrychidae	<i>Dinoderus minutus</i> <i>E. obtusedentatus</i> <i>E. forficula</i> <i>Sinoxylon sudanicum</i>	Bamboo Nabk, fig & mulberry Lebbek, sunt, fig & mango



Table 2. continued

Predator		Host insect	
No.	Scientific name	Family	Scientific name
		Lycidae	<i>Lyctus brunneus</i> <i>Lyctus impressus</i> <i>Lyctus africanus</i>
8	<i>Phloeocopus andresi</i> Sch.	Cerambycidae	<i>Hesperophanes griseus</i>
9	<i>Opilo barbarus</i> Abe	Buprestidae	<i>Anthaxia angustipennis</i> <i>Anthaxia kneuckeri</i> <i>Anthaxia pumila</i>
10	<i>Opilo mollis</i> L.	Buprestidae	<i>Pychomus polita</i> <i>Paracmaeodera elevata</i>
		Cerambycidae	<i>Dichostates subocellatus</i>
11	<i>Thanasimodes gigas</i> Cast.	Buprestidae	<i>A. angustipennis</i> <i>A. congregata</i> <i>A. kneuckeri</i> <i>Paracmaeodera elevata</i> <i>Pychomus polita</i>
12	<i>Teretrius acaciae</i> Reit.	Cerambycidae	<i>Dichostatus subocellatus</i>
13	<i>Teretrius kraatzi</i> Mars.	Bostrychidae	<i>Sinoxylon sudanicum</i>
14	<i>Teretrius pulex</i> Fairm.	Bostrychidae	<i>Sinoxylon sudanicum</i>
15	<i>Platysoma castanipes</i> Mars.	Bostrychidae	<i>Dinoderus minutus</i>
16	<i>Platysoma</i> sp.	Lycidae	<i>Lyctus brunneus</i>
17	<i>Dasytes</i> sp.	Anobiidae	<i>Gastrallus steriatus</i>
		Scolytidae	<i>Scolytus amygdali</i>
		Scolytidae	<i>Scolytus amygdali</i>
		Buprestidae	<i>Melanophila picta</i>
			Host plants Bamboo & lebbek Citrus & mulberry Poinciana Fig Acacia Acacia Acacia Lebbek & mango lebbek, acacia & fig Bamboo Poinciana Apricot Peach Willow & poplar

### III. Observations on some parasitoids and predators

#### A. parasitoids

- ***Callimomoids* sp. (Pteromalidae: Chalcidoidea)**

This Chalcid parasitoid was described without identification by Willcocks (1924). Larvae and pupae are creamy white. Various numbers of parasitoid stages were observed inside the eggs of tamarisk jewel beetle *Straspis squamosa*. Batt (2004) found that the parasitoid overwintered in larval or adult stage, up to 9 parasitoid adults were inhabited a single *Straspis* egg, while 1-2 emergence holes were observed on each egg shell of borer. Such parasitoids identified in this study as *Callimomoids* sp. belonging to family Pteromalidae, subfam . Louriciinae which was recorded for first time in Egypt.

- ***Tanycorphes* sp. (Chalcididae: Chalcidoidea)**

The observation detected that the largest number of this parasitoid emerged from citrus trees infested by *Chrysobothris dorsata* borer, during summer months. Okil (1991) found that the emergence of this parasitoids took place during the period from April to September. Batt (1999) found that parasitized prepupa of beetle transformed to cocoon of parasite after 16-25days, the parasitoids emerged after 23 –28 days and lived 3-5 days.

- ***Cratocentrus* sp. (Chalcididae : Chalcidoidea )**

*Cratocentrus* sp. parasitoid was recorded by Batt (1999) who found that it attacked larval last-stage of fig stem borer, *Sphenoptera trispinosa* and monthly percentage of parasitism was about 29.5 %. Average pupal duration was 26 days whereas average longevity of parasitoid adult was 8.4 day. This parasitoid has three peaks during activity period extended from April to September. Highest percentage of emerged parasitoids recorded from eastern direction at 50 –100 cm. height.

- ***Tetrastichus* sp. (Eulophidae : Chalcidoidea)**

The observation reveled that several parasitoid adults emerged from a single parasitized *Agrilus lituratus* larva which collected from infested plum trees.

- ***Scleroderma domesticum* (Bethyilidae: Bethyloidea)**

This bethylid wasp (ant like) is mainly a parasitoid of wood- boring Cerambycids but it also observed parasitize powder-post beetles (Bostrychidae and Lyctidae). The femeles are wingless and differ so much in appearance from the males. The observation appeared that

*S. domesticum* parasitoid attacked the larvae of eucalyptus stem borer, *Phoracantha semipunctata*, inside larval tunnels and bore through the compacted fibers which seal the opening pupal chamber to reach full grown larvae or pupae inside pupal chambers. The pupation of this parasitoid takes place inside silk cocoon. The males entered the cocoon and mated with the female inside.

- ***Rhoptrocentrus piceus* (Braconidae : Ichneumonoidea)**

Braconids are distinguished by absence of costal cell in forewing and by the coalescence of numerous veins. The vein between cell M<sub>1</sub> and 1<sup>st</sup> M<sub>2</sub> of the front wing is absent. At remove the bark of infested peach branches with *C. dorsata* or *capnodis carbonaria*, observed that this parasitoid enter pupal stage in silk cocoons (about 16 cocoons) founding in adherent mass in larval tunnels of borers.

- ***Habrobracon pectoralis* (Braconidae : Ichneumonoidea)**

Okil (1991) recorded this parasitoid without identification under family Ichneumonidae and found that it was wandering around on the bark of willow plant infested by *Melanophila picta* where some adults were collected. The pupae of this parasitoid were found in pupal cells of beetles replacing the full grown larvae and pupae.

- ***Dendrosoter protuberan* Nees (Braconidae : Ichneumonoidea)**

This parasitoid is a new record in Egypt. Observation revealed that this species attacked late - stage of *Scolytus amygdali* larvae, ovipositing larvae emerged through the bark. Based on number of parasitoids and beetles found that rate of parasitism ranged between 11-18 % during the period from late July and early October.

- ***Ecrestis robarator* (Ichneumonidae : subfam. Pimplinae)**

Ichneumons are closely related to the Braconidae but differ by having cell M<sub>1</sub> and M<sub>2</sub> of the forewing separate. Ovipositor long and permanently extended. This stinging wasp is solitary internal parasitoid emerged from pupal chamber of *C. dorsta* borer through prepared opening under bark of host tree by full grown larva of borer. Batt (1999) reported this parasitoid (without identification) emerged from the skin of *C. dorsta* larva presenting in pupal chamber inside mango tree.

- ***Exeurytoma* sp. (Eurytomidae : Eurytominae)**

This parasitoid emerged from apricot and peach branches infested with *S. amygdali*, it is a new record in Egypt.

- ***Synechocryptus (Cryptus)* sp. (Ichneumonidae : subfam. Phyga-euontinae = Cryptinae).**

This parasitoid was collected as blackish spinning pupae from larval tunnels of *Steraspis squamosa* borer infesting tamarisk. This parasitoid may new record in Egypt. In the laboratory parasitoid adult was emerged and left behind the puparium.

- **Sclerobigid parasitoid (Sclerobigidae: Chrysoidea)**

Adults of this parasitoid were collected from larval tunnels of *Anthaxia angustipennis* founding under the bark of infested branches. This family is recorded for the first time in Egypt. Batt (1999) found that the average percentage of parasitism of this parasitoid was 19 %.

- ***Trogoderma granarius* (Dermestidae : Coleoptera).**

This dermestid beetle is compacted and hairy larva cylindrical and covered with long hairs. It was found under the bark of eucalyptus trees. Helal and El-Sebay (1980) found that *T. granarius* beetles laid its eggs inside larvae, prepupae and pupae of *Phoracantha semipunctata*. Larva of this parasite feeding on internal contents of the host.

**B. on some predators**

- ***Tarsostenus univittatus* (Cleridae : subfam. Tarsosteninae)**

This species is an important predator of powder post beetles (Lyctid and Bostrychid beetles). The adult is small, slender, 3-6 mm long, shiny black except few for a white mark across the middle of elytra, they prey lyctid and bostrychid beetles outside the wood. The larva is elongate, stretched, small and light violet except for brown or yellow marking, there are two recurved hooks in the ninth abdominal segment, they crawl inside infested wood to reach the larvae of powder-post beetles. This species recorded by Alfieri (1976) under sub family Korynetinae.

- ***Denops albofasciatus* (Cleridae:subfam. Tillinae)**

This predator attacks different species of Bostrychid beetles genus *Enneadesmus*, its length is 6-8mm. Basal part of elytra red while the rest of elytra black with broad yellow transverse fascia before middle. The adult of this species is predaceous to different species of *Enneadesmus* adult beetles. The observation detected that predation rate was about 5-7 adult daily. Larvae of this predator were predaceous to *Enneadesmus* larvae inside the wood.

- ***Opilo mollis* Linne (Cleridae : subfam . Clerinae)**

This checkered beetle has blackish head (about 1-1.6mm long) and light brown thorax (about 1.5-1.8mm width), the adult length is about 8-9mm. the elytra have ivory colour with two blackish brown spots or patches on each elytron, the first at the base (about 1mm long), the second near the apex (about 1.8 - 2mm long). The length of elytron is 5-6mm, while the width 2 - 2.5mm. The adult of this predator emerged during the summer months, from different acacia species, associated with the emergence of Buprestid beetles *Anthaxia angustipennis* Klug, *A. kneuckeri* Obenberger, *Paracmaeodera elevata* Klug, *Ptychomis polita* Klug. and Cerambycid beetle, *Dichostatus subocellatus* Fair, while the larvae of this predator prey the larvae of previous insect hosts.

- **Hister beetles (Histeridae)**

Recorded species are predacious on adult borers and their larvae underneath the bark of infested trees and in galleries of wood borers. Adults are sluggish, hard-shelled and often with shortened elytra. Most can feign death.

- ***Tenebroides mauritanicus* (Tenebrionidae)**

These darkling beetles are hard-shelled, found under bark of infested trees and galleries of borers. Larvae are long and slender and are often covered with tough, horny skins. Okil (1991) observed that *T. mauritanicus* beetle was associated with *Melanophila picta* infestation. In laboratory the larvae were found to prey on larvae and pupae of *M. picta*.

#### ACKNOWLEDGMENT

The author wishes to express his appreciation to Prof.Dr. M.M.Salem and Prof.Dr.M.K.El-Akked and S.A.El-Azab. (PPRI, classification section) and Paul M.Marsh (Retired Research Entomologist, SEI, Agric. Res. Service, USDA) for their valuable service and help in identification of some parasitoid and predator species.

#### REFERENCES

1. Abd-Allah, F. F. 1983. Studies on certain borer of olive and almond trees in Egypt. Ph.D. Thesis, Fac. of Agric., Cairo Univ., 240 pp.
2. Abd-Allah, F. F. and A. W. Tadros. 1987. The harmony in the seasonal population trends of fig shot-hole bark beetle, *Hypoborus ficus* Er. and its related parasites on fig trees in Egypt. 12th Intern. Cong. Statis., computer Sci., Social & Demo.Res., Ain Shams Univ.(March 26-April 2, 1987), Cairo, Egypt: 401-412.
3. Alfieri, A. 1976. The Coleoptera of Egypt. Mem. Soc. Ent., Egypte, 5 : 361 pp.
4. Batt, A. M. 1998. Laboratory observations on metallic beetles *Anthaxia congregata* Klug. (Coleoptera:Buprestidae) Egypt J. Agric. Res., 76 (4): 1441- 1449.
5. Batt, A. M. 1999a. Borers infesting mango trees in Egypt. Minufiya J. Agric. Res., 24 (3): 945 – 962.
6. Batt, A. M. 1999b. Survey of the borers attacking deciduous fruit trees in Egypt with reference to certain biological and ecological studies. Egypt J. Agric. Res. 77, (3): 1081 – 1102.
7. Batt, M. A. M. 2002. Studies on some Coleopterous borers infesting fruit and wood trees. M. Sc. Thesis, Fac. Agric., Minufiya Univ, Shibin El-kom, Egypt,188 pp.
8. Batt, A. M. 2004. Field and laboratory observations on some tree borers and their hosts in North Sinai governorate, Egypt. Egypt. J. Agric. Res., 82 (2):559 – 572.
9. El-Akked, M. K. 2003. Revision of Family Cleridae (order : Coleoptera) in Egypt. J. Appl. Sci, 18 (11) : 323- 343.
- 10.El-Akked, M. K. and A. M. Batt. 2003. The first record of the predator, *Thanasimodes gigas* (castelnau) (Coleoptera : Cleridae) in Egypt. Bull. Ent. Soc. Egypt, 80,59 –63.

11. Girgis, G. N., Y. El-Sebay. and H. Helal. 1991. Ecological studies on grapevine borer in Egypt. 4<sup>th</sup> Arab. Cong. of Plant Protection, Cairo, Vol.2 : 474 – 481.
12. Helal, H. and Y. El-Sebay. 1980. The eucalyptus borer *Phoracantha semipunctata* F., behaviour, nature of damage and its parasites and predators in Egypt (Cerambycidae, Coleoptera). Agric. Res. Rev., 58 (1): 21- 30.
13. Ismail, I. I., N. A. Abo-Zeid and F. F. Abd-Allah. 1988. Ecological and behavioural studies on olive tree borers and their parasites. Agric. Res, Rev., 66 (1): 145 – 152.
14. Okil, A. M. 1991. Studies on some tree borers in Fayoum Governorate. Ph. D. Thesis Fac. Agric. El-Fayoum, Cairo Univ. 183 pp.
15. Willcoks, F. C. 1924. A survey of the important economic insects and mites of Egypt with notes on life-history, habits, natural enemies and suggestion for control Bull. Sultanic Agric. Soc. Tech., Sec. II: 482 pp.

## حصص للطفيليات والمفترسات الحشرية التي تهاجم ناخرات أشجار الفاكهة والأشجار الخشبية في مصر

عبد الغنى محمد بط

معهد بحوث وقاية النباتات - مركز البحوث الزراعية - الدقى - مصر

ينبع الدور الهام الذى تقوم به الطفيليات والمفترسات فى برامج مكافحة المتكاملة للآفات من كونها أحد أفرع التوازن الطبيعى الحيوى البيئى لنمو الآفات وأحد الاتجاهات الحديثة فى المحافظة على البيئة من التلوث باستخدام المبيدات. ويعتبر هذا العمل رائد فى مجال الناخرات حيث يهتم بحصر متكامل للطفيليات والمفترسات التى تهاجم ناخرات الأشجار فى البيئة المصرية ليكون قاعدة لبحوث مستقبلية للمكافحة الحيوية للناخرات باستخدام هذه الأعداء الحيوية. وتشير نتائج هذا العمل الى:-

١. حصر ٣١ نوعا من الطفيليات التى تنتمى الى ٩ فصائل تتبع رتبة غشائية الأجنحة و فصيلة واحدة تتبع رتبة غمدية الأجنحة موزعة كالتالى: ستة أنواع لفصيلة Pteromalidae ، نوعان لفصيلة Eurytomidae ، نوع واحد لفصيلة Eupelmidae ، خمسة أنواع لفصيلة Chalcididae ، نوع واحد لفصيلة Eulophidae ، ثلاثة أنواع لفصيلة Bethylidae ، ثلاثة أنواع لفصيلة Ichneumonidae ، ثمانية أنواع لفصيلة Braconidae ، نوع واحد لفصيلة Sclerobigidae ، نوع واحد لفصيلة Dermestidae.
٢. حصر ٨ أنواع من المفترسات تنتمى الى ٤ فصائل تتبع رتبة غمدية الأجنحة موزعة كالتالى: إحدى عشر نوعا لفصيلة Cleridae ، خمسة أنواع لفصيلة Histeridae ، نوع واحد لفصيلة Dasytidae ، نوع واحد لفصيلة Tenebrionidae.
٣. زود الحصر بكلا من العائل الحشرى والعائل النباتى وبعض الملاحظات على بعض الحشرات المتطفلة والمفترسة.