

STATUS OF CERTAIN NATURALLY OCCURRING PREDATORY SPECIES OF ORDER HEMIPTERA-HETEROPTERA IN EGYPT

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Abstract

In Egypt, many Heteropteran species were identified from the beginnings of the twentieth century till now. A review of the predatory species belonging to order Hemiptera-Heteroptera was established by using the available publications. The main covered subjects were the faunistic composition, surveys, seasonal abundance, ecological, biological and taxonomical studies. The recorded predatory species were belonging to families Lygaeidae, Reduviidae, Nabidae, Anthocoridae, Miridae and Termitophylidae. Morphological characters and bio-cycle of some species were clarified. Food consumption and functional response of other species were discussed in more details.

Keywords: Hemiptera-Heteroptera, predatory species, Lygaeidae, Reduviidae, Nabidae, Anthocoridae, Miridae, Termitophylidae.

INTRODUCTION

Hemiptera-Heteroptera (True bugs) is one of the most important orders in the sub-class insecta. Members of this order reach their greatest numbers and diversity of forms in tropical regions (Borror and DeLong, 1979). The actual role of heteropteran key phytophagous and predaceous species of economic importance to plants in Egypt was presented by: Samy, 1963, Abul-Nasr and Samy 1967, Amro, 1983, Abdel-Rahman, 1989, Hamed and Aly, 1987 and Gadallah, 1999. Several classification schemes have been proposed for this order in Egypt earlier by: Horvath, 1910, Montandon, 1916, Priesner, 1951, Priesner and Alfieri, 1953, Priesner and Wagner, 1961 and Linnavuori, 1964). Throughout the 1980's: Amro (1983), Abdel-Wahab (1985) and Aly (1987) concerned with the faunistic composition and biodiversity of Heteropteran species recorded in Upper Egypt. Throughout the last decade Abdel-Galil and Amro (2002), Abdel-Galil, *et al.* (2005) and Amro and Abdel-Galil (2012) dealt with the relative abundance and host plant range of certain species belonging to order Hemiptera-Heteroptera in the same area. The later divided species of the true bugs into four categories: predominantly phytophagous, predominantly predaceous, phytophagous in part and predaceous in part.

Life cycle, biology of *Orius* sp. as one of the most predominant predaceous Heteropteran species in Egypt was studied throughout 1970's by: Tawfik and Ata, 1973a,b,c. However, description and taxonomical characters of certain Heteropteran predators have been proposed by El-Sebaey, 1994, 1996, 1997a,b, 2000, 2001, 2002

and 2003. This manuscript is established to give an extensive review on the conclusion of the most important investigations concerned with the predatory species of order Hemiptera-Heteroptera, in Egypt.

Sources of the Review Articles:

A review of the main predaceous Heteroptera was established. Publications dealing with the ecological studies (survey, seasonal abundance and flight activities), biological studies (Life cycle, food consumption and functional response), the description and taxonomy of certain predaceous Heteroptera were of special interest. Egyptian Journals and Bulletins, in addition to conferences, approved theses and dissertations were the main source of information.

Data analysis:

A partial list of the predatory Heteropteran species recorded in Egypt is established in Table (1). Seventy three species belonging to nineteen genera and six families were listed. Heteropteran families comprising predatory species can be arranged in descending order as follows: Lygaeidae by 22 species (one genus), Reduviidae by 18 species (4 genera), Miridae by 17 species (8 genera), Anthocoridae by 9 species (3 genera), Nabidae by 6 species (2 genera) and Teratophylidae by one species (one genus). Percentages of the recorded predatory genera and species were shown in Figure (1). The obtained data indicated that Lygaeidae, Miridae and Reduviidae contain the highest percentages of the predatory species by 30.14%, 23.29% and 24.66%, respectively. However, Anthoceridae, Nabidae and Teratophylidae contain less numbers of the predatory species by 12.33%, 8.22% and 1.36%, respectively. In fact, most of the collected publications dealt with Anthocoridae, Lygaeidae and Reduviidae because these families comprise the most effective Heteropteran predators.

1- Family Lygaeidae (seed bugs) :

The Lygaeids had a great variation in size, shape and color between its members. Also, they vary in length from about 2-18 mm. Although, some are phytophagous, others are distinctly predators. The big-eyed bugs (subfamily: Geocorine) are unusual among the Lygaeids in being at least partly predaceous (Borror and DeLong, 1979). As a result of this investigation, 22 species and 4 subspecies of the genus *Geocoris* were recorded (Table 1). In this approach Mohamed *et al.* (1998) described 21 species and 6 subspecies belonging to 4 Geocorine genera. However, El-Sebaey (2000) described and keyed 21 species and 4 subspecies of the genus *Geocoris*, synonymes and geographical distribution of this genus in Egypt were also given. The major trend of the Egyptian publications about the genus *Geocoris* was about its distribution and its taxonomical characters. No

articles about *Geocoris* biology and/or predation rate have been obtained during this manuscript.

2- Family Reduviidae (Assassin bugs) :

This is a large group of predaceous bugs. They are usually blackish or brownish in color, the head is elongated with the part behind the eyes neck like. The beak is short (three-segments) fits into a groove in the prosternum. Most species are predaceous on other insects, but a few are blood sucking and frequently bite man (Borror and DeLong, 1979). Eighteen Reduviid species belonging to 4 genera were listed in Table (1). The genera *Coranus* and *Reduvius* constituted the major Reduviid species. These genera were surveyed and described early by (Priesner and Alfieri, 1953). Biology, morphology and functional response of the genus *Coranus*, were studied in more details by Afifi *et al.*, 1993a, 1994b, El-Sebaey, 1997b, El-Shazly and El-Sebaey, 1997 and El-Sebaey, 2001. On the other hand, description and biology of the genus *Reduvius* were studied by Afifi *et al.*, 1993b. She recorded *R. nigricans* on grass and tomato plants. Description of immature stages of this predator has been done. The genus *Vachiria* took more attention. Description, predation rates and functional response of this genus studied in more details by El-Sebaey, 1996, El-Shazly and El-Sebaey, 1997 and El-Shazly, 1998. In a comparison between *Coranus aegyptius* (F.) and *Vachiria natolica* Stal, (El-Shazly and El-Sebaey, 1997) reported that *C. aegyptius* showed significantly higher values of the gross reproductive rates, net replacement rate, instantaneous rate of population growth and a higher capacity for population growth per unit time. In another comparative study about the functional response of the aforementioned species, El-Shazly (1998) stated that the predation data of both predators showed type II responses when fed on the second nymphal instar of the Pentatomid *Eysarcoris ventralis* (Westwood) and the Lygaeid *Spilostethus pandurus* Scopoli.

3- Family Nabidae (Damsel bugs) :

The Nabids are small bugs (3.5-11.00 mm in length) that are relatively slender. These bugs are predaceous on many different types of insects. The most commonly encountered damsel bugs are pall yellowish to brownish (Borror and DeLong, 1979). The genus *Nabis* is common all over Egypt (Priesner and Alfieri, 1953). Two Nabid genera were recorded in Egypt (Table 1) and presented by 10.53% of the heteropteran genera recorded in Egypt (Figure 1a). Four species belonging to the genus *Nabis* were recorded in Egypt as reported by: Horvath (1910) in Aswan, Hoberlandt (1953) in Siwa, Priesner and Alfieri (1953) all over Egypt, Samy (1963) in Giza, Linnavuori (1964) in Ismailia, Amro (1983) in Assiut and Mahmoud (2005) in Qena. Classification of *Nabis capsiformis* Germ., *N. viridis* Brulle and *N. sareptannus*

Dohrn is clarified by El-Sebaey (1997). Also, she recorded *Allaeorhynchus aegyptius* as a new Nabid species (El-Sebaey, 2002). No investigations have been obtained about the biology and/or predation rates of this genus.

4- Family Anthocoridae (Minute pirate bugs) :

These bugs are small (2-5 mm in length), elongated oval and many species are black with whitish markings. Most species are predaceous feeding on various small insects and insect Eggs (Borror and DeLong, 1979). Anthocorid genera and species constituted 15.79% and 12.33% of the recorded Heteropteran predators, respectively (Figure-1). *Orius* and *Xylocoris* were the most dominant Anthocorid genera in Egypt. Several investigators recorded *Orius* species during their survey in different Egyptian areas (Table 1). However, few one's concerned with their life cycle, functional response and taxonomical characters eg. Hafez *et al.*, 1968, Tawfik *et al.*, 1973a,b,c, El-Husseini *et al.*, 1993 and Gomaa and Ibrahim, 2001. Special interest of the genus *Xylocoris* have been done by Tawfik and El-Husseini, 1971b, Tawfik *et al.*, 1982, Awadallah *et al.*, 1983, Marei, 1985 and Tawfik *et al.*, 2002. Marei (1985) reported that *Xylocoris galaktinus* (Fieb.) is the most important predator preying upon the two dominant pests, *Cryptoblabes gnidiella* and *Tribolium confusum* of stored garlic bulbs. However, Tawfik *et al.* (2002), studied the biology of *X. galaktinus* under different temperatures and relative humidities. Eggs productivity, life spans and sex ratio was also reported by the same investigator.

5- Family Miridae (Plant or leaf bugs) :

This family is the largest in the order, and its members are to be found on vegetation almost everywhere. Most species are plant feeders but a few are predaceous on other insects. Their bodies mostly 4-5 mm in length (Borror and DeLong, 1979). Seventeen species belonging to 8 genera were listed in Table (1). Mirid genera were presented by 42.11%, however, its species are presented by 23.29% of all the recorded predatory Heteropteran species (Figure 1). The survey, flight activity, biology and description of the collected Mirid species were the main goal of the obtained articles. Some authors have been concerned with the Mirid predation rates and/or functional response. *Deraeocoris* and *Creontiades* genera took the attention of some researchers. Five species of the genus *Deraeocoris* were keyed and described by El-Sebaey (2003). However, population dynamics and some biological aspects of the Mirid *Creontiades pallidus* Ramb. were studied in more details by Hemeida *et al.* (2004). Predation rates of *Deraeocoris serenus* Douglas and Scott studied later by Amro and Abdel-Galil (2012). They reported that *D. serenus* adult was able to consume daily on average 12.19, 13.63, 14.31, 14.38, 14.88 and 15.50 prey individuals of the aphid *Therioaphis trifolii* (Monell) from early emerged stages until

being 5 days old. Also, they observed that, consumption increased with prey numbers available. They expected that this species can be used as a promising biological control agent. In this approach Boyed (2003) studied the morphological characters of the mouth parts and the chemical analysis of the digestive enzymes of salivary glands and anterior med gut of *Deraeocoris* sp. He found that the right maxillary stylet has two rows of at least seven strongly recurved teeth on the inner surface. Also, he found trypsin like enzyme, a chymotrypsin like enzyme and pectinase in the salivary gland. Moreover, some of these enzymes were found in the med gut.

6- Family Termatophylidae:

Borror and Delong (1979), stated that the Termatophylid bugs are belonging to family Miridae. However, in Egypt (Priesner and Alfieri, 1953) recorded the genus *Termatophylum* under family Termatophylidae. One Termatophylid genus and one species only were recorded in Egypt (Table 1). This predator was recorded among the fauna of stored drug materials (Tawfik *et al.*, 1985). Also, Awadallah *et al.* (1985) recorded *Tribolium confusum* as the most adequate prey of *Termatophylum insigne*. More biological aspects on this Termatophylid predator were discussed by Tawfik *et al.* (1986). They stated that the hygrothermic conditions 20°C and 62% RH, are the optimal conditions for rearing this Termatophylid. Also, they recommended to store drug material at this low temperature that will be in favor to the predator activity and in the same time effect hardly the population of associated pests.

Table 1. A partial list of the predatory Heteropteran genera and species recorded in Egypt.

Families, genera and species	Scope of study	Author(s) and year
1- Family: Lygaeidae		
<i>Geocoris acuticeps</i> Signoret	Survey & Taxonomy	Priesner and Alfieri (1953), Mohamed <i>et al.</i> (1998)
	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris albidus</i> Jakovlev	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris anticus</i> Pericart.	Survey, Taxonomy & Description	Mohamed <i>et al.</i> (1998)
<i>Geocoris arenarius</i> (Jakovlev)	Survey & Taxonomy	Priesner and Alfieri (1953)
	Survey, Taxonomy & Description	Mohamed <i>et al.</i> (1998), El- Sebaey (2000)
<i>Geocoris canfalonerii</i> (Bergevin)	Survey, Taxonomy & Description	Mohamed <i>et al.</i> (1998), El- Sebaey (2000)
<i>Geocoris collaris</i> Puton.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Geocoris fallax</i>	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris henoni</i>	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris hispidulus</i> Puton.	Survey & Taxonomy	Priesner and Alfieri (1953)
	Survey, Taxonomy & Description	Mohamed <i>et al.</i> (1998), El- Sebaey (2000)
<i>Geocoris hyalinus</i> Fieber	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris lautus</i> Montandon	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris lineola</i> (Ramb.)	Survey, Taxonomy & Description	Mohamed <i>et al.</i> (1998), El- Sebaey (2000)
<i>Geocoris megacephalus</i> (Rossi)	Survey & Taxonomy	Priesner and Alfieri (1953)
	Survey	Amro (1983), Abdel-Galil and Amro (2002), Mohamed (2005), Abdel-Galil <i>et al.</i> (2005), Amro and Abdel-Galil (2012)
	Survey, Taxonomy & Description	Mohamed <i>et al.</i> (1998), El- Sebaey (2000)
<i>Geocoris megacephalus accipitalis</i> Pufour	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris megacephalus anaemiatus</i> Mont.	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris megacephalus desortus</i> Mont.	Survey, Taxonomy & Description	El-Sebaey (2000)
<i>Geocoris megacephalus siculus</i> (Fieber)	Survey, Taxonomy & Description	El-Sebaey (2000)

Table 1. Cont.

Families, genera and species	Scope of study	Author(s) and year
<i>Geocoris nigriceps</i> Reuter	Survey & Taxonomy Survey, Taxonomy & Description	Priesner and Alfieri (1953) Mohamed <i>et al.</i> (1998), El-Sebaey (2000)
<i>Geocoris pallidipennis</i> (Costa)	Survey & Taxonomy Survey Survey, Taxonomy & Description	Priesner and Alfieri (1953) Amro (1983), Mohamed (2005), Abdel-Galil <i>et al.</i> (2005) Mohamed <i>et al.</i> (1998), El-Sebaey (2000)
<i>Geocoris scutellaris</i> (Puton)	Survey & Taxonomy Survey, Taxonomy & Description	Priesner and Alfieri (1953) Mohamed <i>et al.</i> (1998), El-Sebaey (2000)
<i>Geocoris tanninimensis</i> Linnavuori	Survey, Taxonomy & Description	Mohamed <i>et al.</i> (1998), El-Sebaey (2000)
<i>Geocoris timidus</i> Puton	Survey & Taxonomy Survey, Taxonomy & Description	Priesner and Alfieri (1953) El-Sebaey (2000)
2- Family: Reduviidae	Survey & Taxonomy	El-Shazly (1987)
<i>Alloeocranum bannulipes</i> (Mont. et Sign.)	Biology	El-Sebaey (1994) Tawfik <i>et al.</i> (1983a,b,c), Awadallah <i>et al.</i> (1990)
<i>Coranus</i> sp.	Biology	Afifi <i>et al.</i> (1994a,b)
<i>Coranus aegyptius</i> (F.)	Survey	Amro (1983), Abdel-Galil and Amro (2002), Amro and Abel-Galil (2012)
	Survey & Taxonomy Description & Biology Functional response	Priesner and Alfieri (1953) El-Sebaey (1997b) El-Shazly (1998), El-Shazly & El-Sebaey (1997)
<i>Coranus Africana</i>	Taxonomy	El-Sebaey (2001)
<i>Coranus angulatus</i> Stal	Survey & Taxonomy Description & Biology	Priesner and Alfieri (1953) Afifi <i>et al.</i> (1993a)
<i>Coranus arenaceus</i> Walker	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Coranus blanditus</i> Mill.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Coranus niger</i> (Ramb.)	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Coranus priesneri</i> Mill.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Coranus tuberculifer</i> Reut.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Reduvius armipes</i> Reut.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Reduvius dorsalis</i> Stal.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Reduvius jakovlevi</i> Reut.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Reduvius nobulosus</i> (Klug.)	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Reduvius nigricans</i> (Klug.)	Survey & Taxonomy	Priesner and Alfieri (1953)
	Description & Biology	Afifi <i>et al.</i> (1993b)
<i>Reduvius pallipes</i> (Klug.)	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Reduvius tabidus</i> (Klug.)	Survey & Taxonomy	Priesner and Alfieri (1953)

Table 1. Cont.

Families, genera and species	Scope of study	Author(s) and year
<i>Vachiria natolica</i> Stal.	Description & Biology Predation rate Functional response	El-Sebaey (1996) El-Shazly and El-Sebaey (1997) El-Shazly and El-Sebaey (1997), El-Shazly (1998)
3- Family: Nabidae		
<i>Allaeorhynchus aegyptius</i>	Taxonomy	El-Sebaey (2002)
<i>Nabis</i> sp.	Survey	Abdel-Galil <i>et al.</i> (2005)
<i>Nabis capsiformis</i> (Germar)	Survey	Amro (1983), Abdel-Galil and Amro (2002), Amro and Abdel- Galil (2012)
<i>Nabis sareptanus</i> Dohrn.	Taxonomy & Description Survey & Taxonomy Taxonomy & Description	El-Sebaey (1997a) Priesner and Alfieri (1953) El-Sebaey (1997a)
<i>Nabis sitiens</i> Walk.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Nabis viridis</i> Brulle.	Survey & Taxonomy Taxonomy & Description	Priesner and Alfieri (1953) El-Sebaey (1997a)
4- Family: Anthocoridae		
<i>Blabrostethus piceus</i> Fiber	Life history (Bio-cycle)	Tawfik and El-Husseini (1971a)
<i>Orius</i> spp.	Survey	Amro (1983), Abdel-Rahman (1989), Abel-Galil <i>et al.</i> (2005), Amro and Abdel-Galil (2012)
<i>Orius albidipennis</i> (Reut.)	Flight activity Survey	Abdel-Galil <i>et al.</i> (2006a) Amro (1983), Abdel-Galil and Amro (2002), Moahmed (2005), Amro and Abdel-Galil (2012). El-Gantiry <i>et al.</i> (1999)
	Biology Survey & Taxonomy Ecology	Priesner and Alfieri (1953) Abd-Ella (1980), Salem <i>et al.</i> (1999)
	Biology	Agamy <i>et al.</i> (2000), El-Husseini <i>et al.</i> (2000).
	Morphology Description Life history	Hafez <i>et al.</i> (1968) Tawfik <i>et al.</i> (1973a) Tawfik <i>et al.</i> (1973b)
<i>Orius laevigatus</i> Fabricius	Survey	Abd-Ella (1980), Amro (1983), Salem <i>et al.</i> (1999), Abdel-Galil and Amro (2002), Abdel-Galil <i>et</i> <i>al.</i> (2005), Mohamed (2005), Amro and Abdel-Galil (2012).
	Survey & Taxonomy Description Morphology	Priesner and Alfieri (1953) Tawfik <i>et al.</i> (1973a) Hafez <i>et al.</i> (1968)

Table 1. Cont.

Families, genera and species	Scope of study	Author(s) and year
	Life history	Tawfik <i>et al.</i> (1973c)
	Biology	El-Husseini <i>et al.</i> (2000), Agamy <i>et al.</i> (2000), Gomaa and Ibrahim (2001), Gomaa and Agamy (2002).
<i>Orius majusculus</i> Reut.	Biology	El-Husseini <i>et al.</i> (1993)
<i>Orius niger</i> Walf.	Survey & Taxonomy	Priesner and Alfieri (1953)
	Survey	Salem <i>et al.</i> (1999 a,b)
<i>Xylocoris afer</i> (Reut.)	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Xylocoris galactinus</i> (Fieb.)	Survey & Taxonomy	Priesner and Alfieri (1953)
	Biology	Tawfik and El-Husseini (1971b), Marei (1985), Tawfik <i>et al.</i> (2002).
<i>Xylocoris flavipes</i> (Reut.)	Survey & Taxonomy	Priesner and Alfieri (1953)
	Biology & Biocycle	Abd-Ella (1981), Tawfik <i>et al.</i> (1971b), Awadalla and Tawfik (1972), Awadallah <i>et al.</i> (1983), Awadallah <i>et al.</i> (1986).
5- Family: Miridae		
<i>Argyrotelaenus elegans</i> Reutter & Poppius	Survey & Taxonomy	El-Sebaey (2003)
<i>Campylomma angustula</i> Reut.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Campylomma impicta</i> Wagner	Survey	Amro (1983)
	Seasonal abundance	Amro and abdel-Galil (2012)
<i>Campylomma nicolasi</i> Put. and Reut.	Survey	Abdel-Galil <i>et al.</i> (2005).
	Survey & Taxonomy	Priesner and Alfieri (1953)
	Flight activity	Abdel-Galil <i>et al.</i> (2006a)
	Seasonal abundance	Abdel-Galil <i>et al.</i> (2006b)
<i>Campylomma zizyphi</i> Reut.	Survey & Taxonomy	Priesner and Alfieri (1953)
<i>Capsoides lineolatus</i> (Brulle)	Survey & Description	El-Sebaey (2003)
<i>Cranocapsus puncticeps</i> Wanger	Survey & Description	El-Sebaey (2003)
<i>Cranocapsus sinuaticollis</i> (Reutter)	Survey & Description	El-Sebaey (2003)
<i>Creontiades pallidus</i> (Ramb.)	Survey & seasonal abundance	Amro (1983), Abdel-Galil and Amro (2002), Abdel-Galil <i>et al.</i> (2006b), Amro and Abdel-Galil (2012).
	Survey & Taxonomy	Priesner and Alfieri (1953)
	Flight activity	Abdel-Galil <i>et al.</i> (2006a)
	Ecology	Hemeida <i>et al.</i> (2004)
	Biology	Hemeida <i>et al.</i> (2004)

Table 1. Cont.

Families, genera and species	Scope of study	Author(s) and year
<i>Cyrtopeltis (Nesidiocoris) tenuis</i> Reut.	Survey	Amro (1983), Abdel-Galil and Amro (2002), Amro and Abdel-Galil (2012).
	Survey & Taxonomy	Priesner and Alfieri (1953)
	Biology	El-MInshawy <i>et al.</i> (1977)
<i>Deraeocoris aegyptius</i>	Survey & Description	El-Sebaey (2003)
<i>Deracocoris martini</i> (Puton)	Survey & Description	El-Sebaey (2003)
<i>Deracocoris pallens</i> Reut.	Biology	Al-Hitty <i>et al.</i> (1988)
<i>Deraeocoris punctulatus</i> (Fallen)	Survey & Description	El-Sebaey (2003)
<i>Deraeocoris serenus</i> (Douglas & Scott)	Survey	Amro (1983), Abdel-Galil <i>et al.</i> (2005), Mohamed (2005), Abdel-Galil and Amro (2002), Amro and Abdel-Galil (2012).
	Survey & Description	El-Sebaey (2003)
	Flight activity	Abdel-Galil <i>et al.</i> (2006a)
	Food consumption	Mohmed (2005).
<i>Deraeocoris sinai</i>	Survey & Description	El-Sebaey (2003)
<i>Platycapsus acaiae</i> Reuter	Survey & Description	El-Sebaey (2003)
6- Family: Termataphylidae		
<i>Termatophylum</i>	Survey & Description	El-Sebaey (2003)
<i>insigne</i> Reuter	Biology	Tawfik <i>et al.</i> (1986)

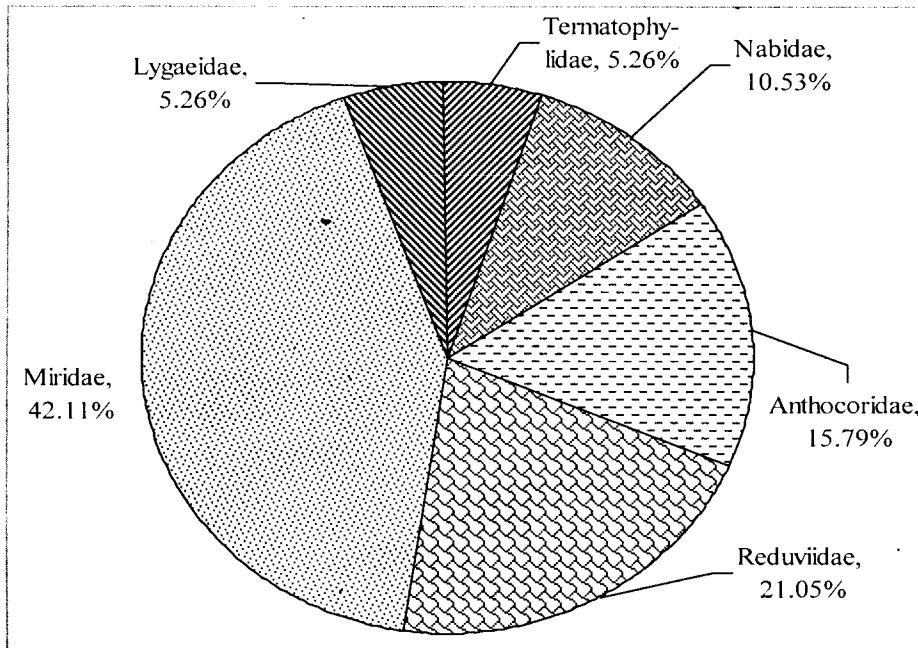


Figure 1 (a). Percentage of heteropteran predaceous genera recorded in Egypt.

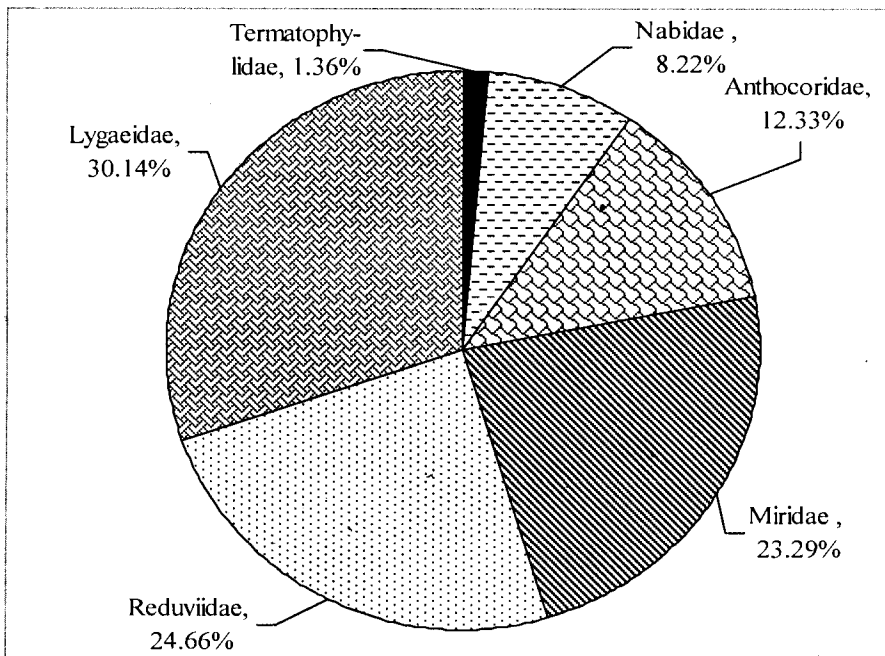


Figure 1 (b). Percentage of heteropteran predaceous species recorded (or appear as partly predaceous) in Egypt.

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دراسات مرجعية علي بعض الأنواع المفترسة المتواجدة في الطبيعية
 من رتبة نصفية الأجنحة في مصر

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منذ بدايات القرن العشرين تم تعريف العديد من الأنواع الحشرية التابعة لرتبة نصفية الأجنحة في مصر. باستخدام المراجع المتاحة أجريت دراسات مرجعية علي الأنواع المفترسة التابعة لرتبة نصفية الأجنحة. كانت أهم الموضوعات التي تم عرضها بصفه أساسيه أو بصفه جزئيه تحت ظروف مختلفة هي التركيب النوعي وحصر المفترسات والوفرة الموسمية لها بالإضافة للدراسات البيئية والحيوية و التقسيمية التي أجريت عليها. وجد أن الأنواع المفترسة التي تم تسجيلها تتبع عائلات Lygaeidae و Reduviidae و Nabidae و Anthocoridae و Miridae و Termatophylidae. أجري سرد للدراسات التي تناولت الصفات المورفولوجية ودورات حياة بعض هذه المفترسات. كما تم عرض للأبحاث التي تناولت معدلات الاستهلاك للغذاء والكفاءة الافتراضية لأهم المفترسات التابعة لرتبة نصفية الأجنحة.