

Original Research Article

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Survey of Coleopteran Insects on Alfalfa Plant

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ABSTRACT

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In this study, 81 specimens of the beetles associated with alfalfa fields, were collected from different region of Iraq are investigated. 17 species belonging to 16 genera and 8 families were determined; these species are: *Sitona* sp., *Hypera postica* (Gyllenhal), *Lixus scolopax* (Boheman), *Spermophagus sericeus* (Geoffroy), *Clanoptilus judex* (Abeille de Perrin), *Clanoptilus viridanus* (Mulsant & Wachanru), *Clytra valeriana* Menetries, *Altica deserticola* (Weise), *Aulacophora foveicollis* (Lucas), *Coccinella septempunctata* (Linnaeus), *Hippodamia variegata* (Goeze), *Stethorus gilvifrons* (Mulsant), *Scymnus interruptus* (Goeze), *Adalia bipunctata* (Linnaeus), *Omophlus* sp., *Tropinota squalida* (Scopoli) and *Certallum ebulinum* (Linnaeus). The specimens of Curculionidae were collected in high percent, whereas Cerambycidae was lowest percent.

Introduction

Alfalfa has been cultivated for forage longer than any other crop. Not only does alfalfa have very high yield potential, but it is also one of the most palatable and nutritious forage crops, because of its high protein and vitamin content; alfalfa is a primary component in the diet of dairy cattle as well as beef cattle and horses. Alfalfa, *Medicago sativa* Linnaeus, is among the most prized of forage and is grown worldwide (Summers, 1998).

Alfalfa plant provides a large number of arthropods; some of them are pests, but many have no effect on the crop (Alsuhaibani, 1996). Alfalfa supports a

diverse arthropod fauna; at least 1,000 species have reported from alfalfa in the United States, with perhaps 100-150 of these causing some degree of injury. Few of these, however, can be described as key pest species, the rest are of only local or sporadic importance, or are incidental herbivores, entomophagous (parasites and predators), or pollinators (Flanders and Radcliffe, 2013).

Beetles tend to visit flowers to feed generally on floral tissue, and may damage the flowers and developing fruit in the process. Some groups of beetles, such as the flower scarabs and members of families Melyridae and Mordellidae are adapted to use floral resources. Some soldier beetles

(family Cantharidae) feed extensively on pollen and can move to many different flowers during their adult lives.

In Iraq, there were several studies on alfalfa insects, such as: Ghaeb (1978), Augal *et al.* (2012) and Al -Saffar (2013).

The aim of this study was to determine the prevalence of the coleopteran species which were founded on alfalfa in different regions from middle and south of Iraq.

Materials and Methods

Many samples were collected from alfalfa in several region of Iraq, by using sweeping net during 2015. The coleopteran insects were killed by freezing for 24 hours , some coleopteran were mounted by insect pin , small kept in gelatin capsules; the date and localities of sampling were recorded.

Coleopteran were diagnosed by using different taxonomic keys such as: Duffy (1952), Pope (1953), Crowson (1956), Brendell (1975), Ismail (1983), Jessop (1986), Khudair (2014), Gruve and Dober (2005) and Saleh (2007); In addition to comparing it with samples diagnosed earlier and stored at the Iraq Natural History Research Center and Museum, University of Baghdad. Dino light microscope was used for taking photo of samples with scale of measurements.

Results and Discussion

In this investigation there are 17 species (Plate 1, 2 and 3) belong to 16 genera and 8 families were collected; In total the percent of alfalfa beetle groups investigated were recorded; Curculionidae most abundant with 29.63% of the total number of individuals, followed by Malachiidae 17.28%, Chrysomelidae 14.81%, Bruchidae 13.58%, Coccinellidae 11.11%, Scarabaeidae 8.64%,

Tenebrionidae 3.7 and Cerambycidae 1.23 %.

A list of the species is given below:

Curculionidae

***Sitona* sp.**

Sitona species specialize on legumes, plants of the family Fabaceae, the larvae eat root nodules and the adults eat leaves (Velázquez de Castro *et al.*, 2007). Arbab and McNeill (2014) mentioned that several species of *Sitona* weevils are important agricultural pests of alfalfa.

Materials Examined (4 specimens): Wasit prov. Al Zubaidya-Sherhan vill, 4, 28. May. 2015.

Distribution: Holarctic region (Velázquez de Castro *et al.*, 2007).

***Hypera postica* (Gyllenhal, 1813)**

This species is the most damaging phytophagous pest and the major limiting factor in alfalfa production in the most regions of the world (Blodgett *et al.*, 2000). Direct alfalfa weevil damage is caused by adults and larvae feeding on the growing tips, leaves and buds of alfalfa, which removes crop biomass and reduces harvested yield (Fick & Liu, 1976).Shebl *et al.* (2009) were found the alfalfa weevil *Hypera postica* is the most important insect pests of alfalfa in his investigations.

Materials Examined (17 specimens): Baghdad province: Al-Mada'in, 4, 18.Apr.2015; Bab Al Muadham, 1, 22. May. 2015. Wasit prov., Ash Shahabi, 12, 18. Jun. 2015.

Distribution: Iraq(Derwesh, 1965); East Palaearctic, Near East (Asian Turkey,

Caucasian Russian republics, Georgia, Armenia, Azerbaijan, Lebanon, Syria, Israel, Jordan, Egypt, Arabian peninsula, Iran, Nearctic region, North Africa (Anonymous, 2009).

Lixus scolopax (Boheman, 1836)

Dieckmann (1983) referred that the Asteraceae is the host plants of this species; while Alsuhaibani (1996) was registered *Lixus* sp. as phytophagous insects on alfalfa plant, and agreement with the present study, and we expected the alfalfa plants also another host plant for this species.

Materials Examined (3 specimens): Baghdad province: Jaddria, 3, 3.Nov.2015.

Distribution: Iraq (Derwesh, 1963) Western Palearctic (Dieckmann, 1983).

Family: Bruchidae

Spermophagus sericeus (Geoffroy, 1785)

There are approximately 90 species of *Spermophagus* that have been described in the Old World. Twenty-four species of *Spermophagus* have been reported to feed in species of Convolvulaceae (Romero and Johnson, 2000). In Europe, *Spermophagus sericeus* only known species to breed on seeds of *Convolvulus arvensis* L. (Southgate, 1979). Based on the above, the presence of this species on alfalfa plant in our investigations, it plays the role of important pollinators of flowers.

Materials Examined (11 specimens): Baghdad province: Bab Al- Muadham, 3, 24.Apr.2015; Wasit prov. Ash Shahabi, 8, 18. Jun. 2015.

Distribution: widely distributed in the Palearctic region (Borowiec, 1985),

Derwesh (1965) was listed this species in Iraq.

Family: Malachiidae

Clanoptilus judex (Abeille de Perrin, 1885)

Ezzatpanah (2011) mentioned that species of *Clanoptilus makhani* Ezzatpanah, 2011 was feeding on pollen from flowers of Poaceae; but in our investigations we collected the specimens of the *Clanoptilus judex* on flowers of alfalfa.

Material Examined (9 specimens): Baghdad province: Bab Al- Muadham, 2, 2.May.2015; Al-Mada'in, 4, 18.Apr.2015. Wasit province: Al-Zubaidya, 2, 24.Apr.2015; Aziziyah, 1, 2.May.2015.

Distribution: Palearctic region (Löbl & Smetana, 2007).

Clanoptilus viridanus (Mulsant & Wachanru, 1852)

Synonym in Iraq: *Malachius viridanus* Mulsant & Wachanru, 1852.

This species also in previous, it was collected from flowers.

Material Examined (5 specimens): Wasit: Al Dabuny, 5, 5.May.2015.

Distribution: Iraq (Derwesh, 1965); Lebanon, Syria, Turkey (Yildirim and Bulak, 2012).

Family: Chrysomelidae

Clytra valeriana Menetries, 1832

Adults of this family are living on a life plants, usually consuming the leaves and flowers (Chapman, 1982), in our

investigations the specimens of this species are shown feeding on flowers of alfalfa.

Material Examined (2 specimens): Baghdad province: Al-Mada'in, 2, 18.Apr.2015.

Distribution: Iraq (Derwesh,1965); South Russia, Iran, Turkey, Greece (Clavareau, 1913); S European Russia, E Mediterranean (Winkler, 1924-1932); S Ukraine, Rostov Region, Stavropol Region, Caucasus, Transcaucasia, Balkan Peninsula (Lopatin, 1984); Greece and Bulgaria, Central Asia, Caucasus (Warchalowski, 2003).

Altica deserticola (Weise, 1889)

Altica deserticola is phytophagous;Furth (1980) referred to the host of this species is Unknown; whereas Aslan *et al.* (2004) collected this species from *Epilobium* (Onagraceae)and *Glycyrrhiza glabra* Linnaeus (Fabaceae), and the species collected from *Medicago sativa* in the current study and we expect to have this species of beetles more than a host plant.

Material Examined (7 specimens): Iraq, Baghdad province: Jaddria, 7, 3.Nov.2015.

Distribution: Iraq (Derwesh, 1965); SE Russia, Caucasus, Armenia, Turkestan, Siberia; Mongolia; China and Taiwan (Kimoto, 1971); Turkey, Iran, Afghanistan (Lopatin, 1963); Syria, Jordan and Israel.

Aulacophora foveicollis (Lucas, 1849)

This species as pest on many plants, the adults are feed on leaves and flowers; the current results agreement with Rashid & khan (2014), they were mentioned that the species of *A. foveicollis* is polyphagous feed voraciously on leaves, flower buds and flowers which may reach up to 35-75% at

seedling stage.

Material Examined (3 specimens): Erbil province: Shaqlawa, 3, 10.10.2015.

Distribution: France, Greece, Italy, Portugal, Spain. Egypt, Afghanistan, Cyprus, Oman, Pakistan, Saudi Arabia, Russia, Syria, Turkey, Yemen, Afrotropical region and Oriental region (Ahmad *et al.*, 2013).

Family: Coccinellidae

In previous studies, Abdulmadzhid (1973) recorded 11 species of Coccinellidae in fields of alfalfa. The natural enemies or predators of aphids that parasites on *Medicago* sp. were studied by many authors such as: Wheeler (1977), Takahashi and Naito (1984) and Shebl *et al.* (2009). The occurrence of coccinellid species are most beneficial in fields of alfalfa, because their natural enemies for aphids.

Coccinella septempunctata (Linnaeus, 1758)

Material Examined (4 specimens): Baghdad province: Al-Mada'in, 4, 18.Apr.2015.

Distribution: Cosmopolitan (Ashfaque *et al.*, 2013).

Hippodamia variegata (Goeze, 1777)

Material Examined (1 specimen): Baghdad province: Jaddria, 1, 15.Apr.2015.

Distribution: Iraq (Derwesh, 1965); wide distribution range in the Palearctic and extends to Nearctic areas (Obrycki and Orr, 1990).

Stethorus gilvifrons (Mulsant, 1850)

Plate.1 A- *Sitona* sp. B- *Hypera postica* C- *Lixus scolopax* D- *Spermophagus sericeus*
E- *Clanoptilus judex* F- *Clanoptilus viridanus* G- *Clytra valeriana* H- *Altica deserticola*

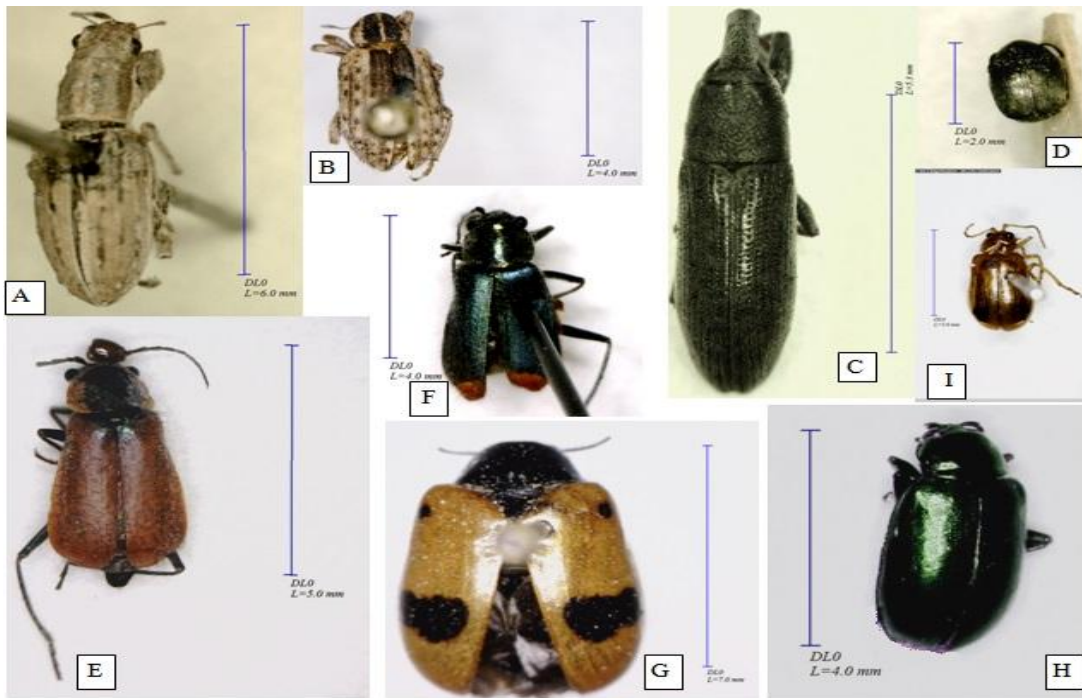


Plate.2 A- *Coccinella septempunctata* B- *Hippodamia variegata* C- *Stethorus gilvifrons* D- *Scymnus interruptus* E- *Adalia bipunctata*

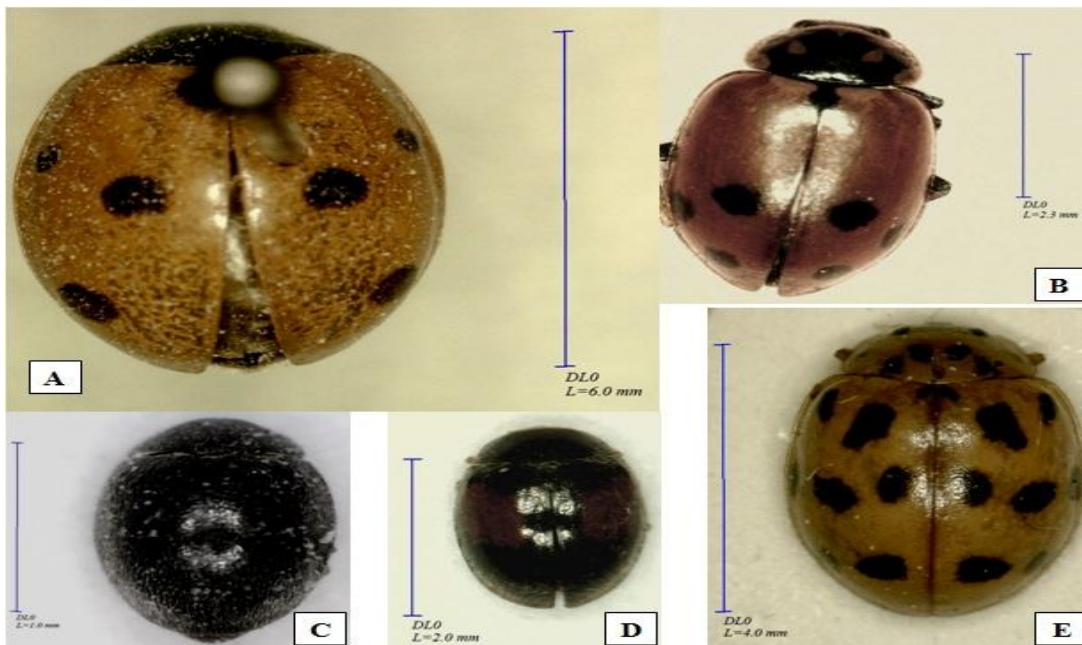
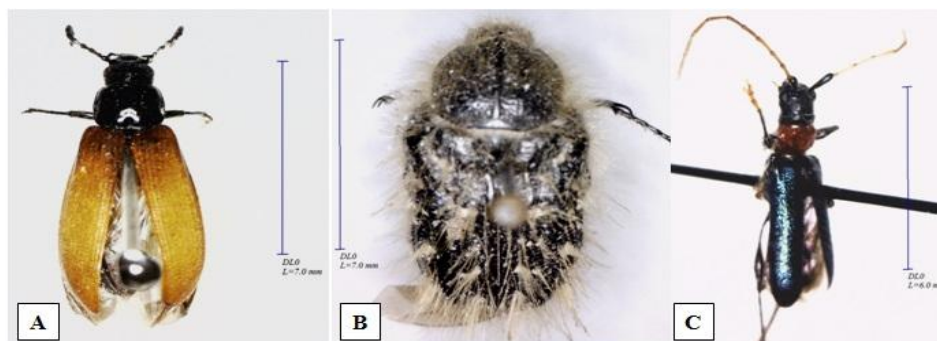


Plate.3 A- *Omophlus* sp. B- *Tropinota squalida* C- *Certallum ebulinum*



Material Examined (1 specimen): Baghdad province: Jaddria, 1, 3.May.2015.

Distribution: Mediterranean Region, Middle East, Saudi Arabia, Pakistan, Kashmir, India and Oriental Region (Samin and Shojai, 2013).

Scymnus interruptus (Goeze, 1777)

Material Examined (2 specimens): Baghdad province: Jaddria, 2, 3.Nov.2015.

Distribution: Iraq (Derwesh, 1963); Palaearctic species (Serafim, 1997).

Adalia bipunctata (Linnaeus, 1758)

Synonym: *Adalia fasciatopunctata* (Faldermann, 1835) according to Hodek *et al.*(2012).

Material Examined (1 specimen): Erbil province: Shaqlawa, 1, 6.July.2015.

Distribution: Central Asia, Europe and North America (Hodek, 1973; Hodek & Honěk, 1997).

Family: Tenebrionidae

Omophlus sp.

Most species are of unknown economic

importance, although larvae of *Omophlus* and related genera are root feeders, and have been recorded as pests of potatoes and sugar beet (Booth *et al.*, 1990). Adults of this species were collected on flowers, because they feeding on pollen.

Material Examined (3 specimens): Erbil province: Shaqlawa, 1, 17.May.2015

Distribution: Widely distributed in Palaearctic region (Yildirim and Kiliç, 2008); Iraq (Derwesh, 1965).

Family: Scarabaeidae

Tropinota squalida (Scopoli, 1783)

Our results agree with Shebl *et al.* (2009); they list this species in most pest insects in alfalfa field in Egypt.

Material Examined (7 specimens): Erbil province: Shaqlawa, 7, 25.April.2015.

Distribution: Europe (Albania, Boznia Herzegovina, Bulgaria, Croatia, France, Greece, Italy, Malta, Macedonia, Portugal, Slovenia, Spain, Switzerland, Serbia, Montenegro and Turkey); Asia and North Africa (Pivotti *et al.*, 2011); Iraq (Derwesh, 1965).

Family: Cerambycidae

Certallum ebulinum (Linnaeus, 1767)

Ambrus *et al.* (2014) collected this species on flowers belong to different species of plants; in our investigations the members of this species also were collected from flowers of alfalfa. That means these beetles are important and flower pollinators.

Material Examined (1 specimen): Erbil province: Shaqlawa, 1, 25.April.2015.

Distribution: Iraq (Derwesh, 1963) Europe (Portugal, Spain, France, Malta, Greece, Bulgaria, European Turkey, Ukraine, European Russia), Caucasus, Turkey, Iran, Iraq, Israel, Jordan, Lebanon, Syria, Cyprus, North Africa: Algeria, Egypt, Libya, Morocco and Tunisia) (Okutaner *et al.*, 2011).

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