

## **Entomofauna of Alfalfa in Riyadh, Saudi Arabia**

**Ali M. Alsuhaibani**

*Department of Plant Protection, College of Agriculture, King Saud University,  
P.O. Box 2460, Riyadh 11451, Saudi Arabia*

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**Abstract.** Insect fauna of alfalfa was surveyed during two successive years (from October, 1990 until September, 1992) at Derab Experimental Research Station, College of Agriculture, King Saud University, Riyadh. Samples of insects were collected weekly using a standard 15" sweeping net. The identification of insects revealed the prevalence of 103 insect species belonging to 94 genera, 49 families and 10 orders of class insecta. Of these insects, 18 species were recorded for the first time in Saudi Arabia. The insect fauna of alfalfa was divided, according to their importance to alfalfa grower, to the following categories of insects expressed in percentages; 48% phytophagous insects, 25.6% entomophagous insects, 21.6% pollinating insects and 4.8% for other insects (saprophagous, scavengers --- etc.). Studying entomofauna of alfalfa is important for developing integrated pest management programs for alfalfa and neighboring crops.

### **Introduction**

Alfalfa, *Medicago sativa*, (Family Leguminosae), is the most important forage crop grown in Saudi Arabia. In 1992, the area devoted to alfalfa production in the Kingdom exceeded 68 thousand hectares [1, p.46].

Alfalfa is a perennial legume with a high protein content and lush, dense foliage. A stand of alfalfa sometimes lives for as long as 30 years [2, p.3] and therefore, provides a relatively stable and favorable habitat for a large number of arthropods. Some of these arthropods are pests, but many have no effect on the crop or are even beneficial.

Insect species classified as pests are those whose feeding results in reduced yields of alfalfa forage or seed. Beside these insect pests, alfalfa also serves as a reservoir for a great variety of beneficial insects such as parasites, predators and pollinating

insects. Parasites and predators are significant factors in helping to control, and may prevent alfalfa pests from increasing to damaging level [3, p.8]. Pollenators, however are very important for cross-pollenating alfalfa which depends on pollinating insects for high seed setting [4].

This study aims to list the insects found in alfalfa field and to classify them according to their importance to alfalfa hay growers.

### Materials and Methods

This study was conducted at the Agricultural Research and Experimental Station of Derab, College of Agriculture, King Saud University, Riyadh, Saudi Arabia. Alfalfa was grown in 10 plots,  $5 \times 5$  m. each. Ten pendulum sweeps were taken weekly from each plot using a standard 15-inch sweeping net throughout two successive years starting October, 1990. Insect samples were kept frozen till time of sorting and identification. Insect specimens of large and medium sizes were mounted on pins while small insects were preserved in 70% alcohol. A regular dissecting microscope, fine forceps, Petri dishes, mounting pins, small vials, and 70% ethyl alcohol were usually required for this part of the study. The identification of insects was carried out in the insect museum of the College of Agriculture, King Saud University, Riyadh. Some of the uncommon insect specimens were sent to the Insect Identification and Classification Research Section, Plant Protection Research Institute, Agriculture Research Center, Dokki, Egypt.

### Results and Discussion

The results of this study revealed the presence of 103 insect species belonging to 94 genera, 49 families and 10 orders of Class Insecta. These insects are alphabetically listed according to orders, families, genera and species, and are shown in the following Table. Of these insects, 18 species were recorded for the first time in Saudi Arabia [5,6,7]. According to their importance to alfalfa grower, the insect fauna of alfalfa was divided to the following categories of insects, expressed in percentages; 48% phytophagous insects, 25.6% entomophagous insects, 21.6% pollinating insects and 4.8% for other kinds of insects (saprophagous, scavengers, etc.), Table 1. Of the numerous phytophagous insects in alfalfa, only few insect species may cause economic damage to alfalfa hay. For example, the Egyptian alfalfa weevil *Hypera brunneipennis* and some species of aphids that usually attack alfalfa (such as the spotted alfalfa aphid; *Therioaphis trifolii*, the blue alfalfa aphid; *Acyrtosiphon kondoi* and the cowpea aphid; *Aphis craccivora*), as in the Table, are the most common economic insect pests of alfalfa [8,3].

Wheeler [9] found that the predator fauna of European alfalfa shows a similar generic make-up to that found in alfalfa fields in the United States. For example, the predators; *Orius*, *Nabis*, *Chrysopa*, *Geocoris* and *Coccinella* occurring in European and North American alfalfa fields and can be considered as ecological homologues of insects found in the present study (see Table).

It should be noticed that the total number of insects listed in this study was lower than what was found in similar studies [10]. This can be attributed to the virginity and isolation of the alfalfa plots where samples of insects were collected.

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**Table.** Insect orders, families, genera and species recorded from alfalfa at Derab Experimental Research Station, Riyadh, during two successive years, 1990/1991 and 1991/1992

Order, Family, Genus & Species	Importance of insect			
	Phytophagous	Entomophagous	Pollenators	Others*
<b>Coleoptera</b>				
<b>Bruchidae</b>				
<i>Bruchidius incarnatus</i> Boh.	x			
<i>Spermophagus sericeus</i> . Geoff.	x			
<b>Buprestidae</b>				
<i>Sphenoptera fulgens</i> Cast & Gori	x			
<b>Chrysomelidae</b>				
** <i>Hypocassida subferruginea</i> Sch.	x			
<b>Coccinellidae</b>				
<i>Adonia variegata</i> (Goeze)		x		
<i>Coccinella novempunctata</i>		x		
<i>C. septumpunctata</i>		x		
<i>C. undecimpunctata</i>		x		
<i>Coccinella</i> spp.		x		
<i>Epilachna chrysomelina</i> (F.)	x			
<i>Scymnus interruptus</i> (Goeze)		x		
<b>Curculionidae</b>				
<i>Baris granulipennis</i> Tourn	x			
<i>Hypera brunneipennis</i> (Boh.)	x			
<i>Lixus</i> sp.	x			

Table. (continued)

Order, Family, Genus & Species	Importance of insect			
	Phytophagous	Entomophagous	Pollenators	Others*
** <i>Microlarinus humeralis</i> Tourn	x			
Dermestidae				
** <i>Attagenus scalaris</i> Pic.				x
Meloidae				
<i>Cylindrothrorax</i> sp.	x	x		
Scarabaeidae				
** <i>Maladera castanea</i> (Arrow)	x			
Tenebrionidae				
<i>Scleron orientale</i> (Fab.)				x
Dictyoptera				
Mantidae				
<i>Iris coeca</i> Uvaror		x		
<i>Mantis religiosa</i>		x		
<i>Revetnia</i> sp.		x		
Diptera				
Calliphoridae				
<i>Chrysomya albiceps</i> Wied			x	x
Chloropidae				
<i>Metopostigma tenuiseta</i> (Loew)	x		x	
Culicidae				
<i>Culex pipiens</i>				x
Muscidae				
<i>Musca domestica</i> L.			x	x
Sarcophagidae				
<i>Sarcophaga destructor</i> Mall				x
Syrphidae				
<i>Eristalis aeneus</i> (Scop.)		x	x	
<i>Metasyrphus luniger</i> Meigen		x	x	
<i>Paragus compeaitus</i> Wied.		x	x	
** <i>Syrphus megacephalus</i> Rossi		x	x	
<i>Syrphus</i> sp.		x	x	
** <i>Xanthogramma aegyptium</i> Wied		x	x	
Tephritidae				
<i>Acanthiophilus helianthi</i> (Rossi)	x		x	

Table. (continued)

Order, Family, Genus & Species	Importance of insect			
	Phytophagous	Entomophagous	Pollenators	Others*
<i>Dacus ciliatus</i> (Loew)	x		x	
<i>Trupanea augur</i> Fraucnfeld	x		x	
<i>Tr. stellata</i> (Fuessly)	x		x	
Therevidae				
<i>Psilocephala frauenfeldi</i> Loew	x		x	
Hemiptera				
Alydidae				
<i>Mirperus jaculus</i> Thunberg	x			
Anthocoridae				
<i>Orius albidipennis</i> (Reuter)		x		
Coreidae				
** <i>Agraphopus lethierryi</i> Stal.	x			
Cydnidae				
** <i>Geotomus elongatus</i> H.S.				x
Lygaeidae				
<i>Dieuches mucronatus</i> (Stal.)	x			
** <i>Geocoris desertus</i> Mont.	x	x		
** <i>G. siculus</i> (Fieb.)	x	x		
<i>Geocoris</i> sp.	x	x		
<i>Nysius cymoides</i> (Spinola)	x			
<i>Oxycarenus hyalinipennis</i> (Costa)	x			
** <i>Scantius</i> sp.	x			
Miridae				
<i>Campylomma impecta</i> (unicolor)				
Wagner	x	x		
<i>Creontiades pallidus</i> (Ramb.)	x	x		
<i>Cyrtopeltis Callosa</i> Odh.	x			
<i>Deraeocoris serenus</i> (D. & S.)	x	x		
<i>Eurystylus bellevoeyi</i> (Reuter)	x			
<i>Trigonotylus pallidicornis</i> Reuter	x			
Nabidae				
** <i>Nabis viridis</i> Brulle		x		
Pentatomidae				
<i>Chronatha ornatula</i> (H.S.)	x			
** <i>Eurydema ornatum</i> L.	x			
<i>Eysarcoris inconspicuus</i> (H.S.)	x			

Table. (continued)

Order, Family, Genus & Species	Importance of insect			
	Phytophagous	Entomophagous	Pollenators	Others*
<i>Nezara</i> (Acrosternum)				
<i>millierei</i> Muls & Rey	x			
<i>N. viridula</i> (Linne)	x			
Reduviidae				
<i>Coranus aegyptius</i> (Fab.)		x		
<i>Vachiria natolica</i> Stal.		x		
Rhopalidae				
<i>Liorhyssus hyalinus</i> (Fab.)	x			
Tingidae				
<i>Urentius aegyptiacus</i> Berg.	x			
Homoptera				
Aphididae				
<i>Acyrtosiphon Kondoi</i> Shinji	x			
<i>Aphis craccivora</i> Koch	x			
<i>Therioaphis trifolii</i> (Monell)	x			
Cicadellidae				
<i>Empoasca decipiens</i> Paoli	x			
** <i>Exitianus pondus</i> Ross.	x			
<i>Hecalus</i> sp.	x			
Cixiidae				
<i>Oliarus</i> sp.	x			
Delphacidae				
<i>Toya propingua</i> (Fieb.)	x			
Doctyophoridae				
<i>Philotheria</i> sp.	x			
Hymenoptera				
Andrenidae				
<i>Andrena</i> sp.			x	
Apidae				
<i>Apis mellifera</i>			x	
Colletidae				
** <i>Colletes pumilus</i> Mor.			x	
Halictidae				
** <i>Nemia rufiventris</i> Spin.			x	
** <i>Nomioides punjabensis</i> (Cameron)			x	
<i>N. variegata</i> (OL.)			x	

Table. (continued)

Order, Family, Genus & Species	Importance of insect			
	Phytophagous	Entomophagous	Pollenators	Others*
<b>Ichneumonidae</b>				
** <i>Bathyplectes curculionis</i> (Thoms.)		x		
<i>Henicospilus merdarius</i> (Grav.)		x		
<b>Megachilidae</b>				
<i>Megachile submucida</i> Alf.			x	
<i>Osmia fasciata</i>			x	
<b>Scoliidae</b>				
<i>Campsomeriella thoracica</i> Fab.		x	x	
<i>Scolia erythrocephala</i> Fab.		x	x	
<b>Sphecidae</b>				
<i>Liris haemorhoidalis</i> F.		x	x	
<i>Stizus niloticus</i> Hdl.		x	x	
<b>Xylocopidae</b>				
<i>Xylocopa hottonotatta</i> Smith			x	
<b>Lepidoptera</b>				
<b>Arctiidae</b>				
<i>Utethesa pulchella</i> (Linn.)	x			
<b>Lycaenidae</b>				
<i>Cosmolyce</i> (Lampides) <i>baeticus</i>	x			
<i>Zizeeria karsandra</i> (Moore)	x			
<b>Noctuidae</b>				
<i>Erastria trabealis</i> (Scop.)	x			
<i>Heliothis peltigera</i> Schiff.	x			
<b>Pieridae</b>				
<i>Colias croceus</i> Geoffroy	x			
<b>Pyralidae</b>				
<i>Hymenia recurvalis</i> F.	x			
<b>Neuroptera</b>				
<b>Chrysapidae</b>				
<i>Chrysoprela carnea</i> (Steph.)		x		
<b>Orthoptera</b>				
<b>Acrididae</b>				
<i>Acrotylus insubricus</i> (Scop.)	x			
<i>Aiolopus simulatrix</i> (Walk.)	x			
<i>A. thalassinus</i> Fab.	x			

Table . (continued)

Order, Family, Genus & Species	Importance of insect			
	Phytophagous	Entomophagous	Pollenators	Others*
<i>Heteracris littoralis</i> (Ramb.)	x			
<i>Ochrilidia gracilis</i> Krauss	x			
Tettigonidae				
<i>Phaneroptera sparsa</i> Stal.	x			
Thysanoptera				
Thripidae				
<i>Frankliniella schultzei</i> (Trub.)	x			

\* Zoophagous, Saprophagous, Scavengerous --- etc.

\*\* Newly recorded species.

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## المجموعة الحشرية للبرسيم في الرياض، المملكة العربية السعودية

علي محمد السحيباني

قسم وقاية النبات، كلية الزراعة، الرياض، المملكة العربية السعودية

(ورد البحث في ١٢/١٠/١٤١٥هـ؛ وقُبل للنشر في ٢٢/٦/١٤١٦هـ)

ملخص البحث. أجري مسح للمجموعة الحشرية للبرسيم في محطة الأبحاث والتجارب الزراعية بديراب في الرياض، المملكة العربية السعودية خلال فترة سنتين متعاقبتين (من أكتوبر ١٩٩٠م وحتى سبتمبر ١٩٩٢م). العينات الحشرية تم جمعها أسبوعياً باستخدام شبكة صيد حشرات قياسية. تعريف الحشرات أسفر عن وجود ١٠٣ أنواع من أنواع الحشرات تابعة لـ ٩٤ جنسياً، هذه الأجناس تقع في ٤٩ عائلة حشرية والأخيرة تتبع لـ ١٠ رتب حشرية من صف الحشرات التابع لقبيلة مفصليات الأرجل. كما أسفرت هذه الدراسة أيضاً عن التعرف على ١٨ نوعاً من أنواع الحشرات سجلت لأول مرة في المملكة العربية السعودية. المجموعة الحشرية للبرسيم تم تقسيمها إلى أربع فئات حسب أهميتها لمزارع البرسيم، وكانت النسب المئوية لتلك الفئات من المجموع الكلي للحشرات كمايلي: ٤٨٪ آكلات نبات، ٢٥,٦٪ آكلات حشرات (طفيليات ومفترسات)، ٢١,٦٪ ملقحات أزهار و ٤,٨٪ أنواع حشرية أخرى (حشرات رمية، حشرات كائنة... الخ). إن دراسة المجموعة الحشرية للبرسيم ذات أهمية كبيرة في تصميم وتطوير برامج الإدارة المتكاملة لآفات البرسيم والتي تهدف إلى عدم الإضرار بالحشرات النافعة وبالتالي المحافظة على التوازن الطبيعي وتقليل التلوث البيئي.