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Investigations on the hosts, distribution and efficiency of the natural enemies of the family Aphididae (Homoptera) harmful to pome and stone fruit trees in Izmir province of Aegean Region

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Summary

This study was carried out to find the natural enemies of the species of the family Aphididae (Homoptera) causing serious damage to pome and stone fruit trees, as well as the many other plants. In this paper parasitic species belonging to the families Aphidiidae and Pteromalidae (Hymenoptera) are recorded, from which **Aphidius colemani** Viereck and **Aphidius matricariae** Haliday are new records for Turkey. Nine families in 4 orders and their related 51 species of 29 genera were identified as the predators of the Aphididae family, harmful to pome and stone fruit trees. Among of them **Paragus nigellus** Goeldlin is the first record for the world, while **Phytocoris longipennis** Flor, **Calvia quatuordecimguttata (Linnaeus)**, **Paragus majoranae** Rondani, **Episyrphus auricollis** (Meigen) are new records for Turkey. Distribution, hosts, abundance and efficiency of this natural enemies are given.

Introduction

Izmir is one of the most important agricultural centers of Turkey. The portion of the fruit growing is large enough within the agricultural income. According to the statistics of the year 1978, 21.968.484 trees were present and an amount of 408.100 tons of yield were achieved. The 88,3 % of the trees are pome and stone fruit trees in this region (Anonymous, 1979).

As it is with the other agricultural products, there are several pests causing the loss of both quantity and quality on the pome and stone fruit

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trees. The family Aphididae has a special position. Because the species of this family give damage directly and indirectly by carrying diseases as well.

Both the enviromental pollution and the resistance problem, by the chemical control against the members of this family, force the integrated pest control programs. As a matter of fact several countries utilize widely the beneficials against this pest.

In the view of the above consideration, the natural enemies of the aphidid species on the pome and stone fruit trees and their efficacy are brought into light through this study in İzmir where an integrated control program is desired to establish.

There are various studies on the natural enemies of aphids. But we couldn't give all of them in this study. So, important of them are given below;

Bielawski (1959), Coe (1953), Dauguet (1949), Dusek and Laska (1976), Düzgüneş et al., (1982), Evenhuis (1964), Fraser (1959), Fürsch et al., (1967), Giray (1970), Gourreau (1974), Graham (1969), Hagvar (1974), Harris (1966), Hodek (1973), Leonard (1965), Lyon and Goeldlin (1974), Mader (1924), Nijveldt (1969), Nikol'skaya (1963), Önder (1980), Rosen (1966, 1967, 1969), Sack (1932), Scot (1939), Seguy (1961), Stary (1961, 1965-66, 1966, 1967, 1970, 1973, 1975 a, b, 1976), Şengonca (1980), Uygun (1971, 1978), Vockeroth (1969).

Material and method

Aphid species, harmful to pome and stone fruit trees in Izmir province, and their parasites and predators were the materials of study which was carried out between the years of 1976-1979.

Pome and stone fruit trees were observed from the begining of egg hatching to the overwintering of the aphids. These observations were made a 10 % part of an orchard. In course of the collecting methods were taken from Stary (1970). The other pests, except from the aphids were removed from the plant samples and then they were placed into the plastic pots to observe the feeding of the larvae and nymphs of the predators and to find out the effectiveness of some parasites and predators. Both aphids and natural enemies had been identified. On the other hand some experiments have been conducted with *Coccinella septempunctata* L., *Adonia variegata* (Goeze) (Col., Coccinellidae) and *Episyrphus balteatus* (De Geer) (Dip., Syrphidae) to find out the functional response. By this study some observations were made whether the microbial agents of the aphids are present .

Results and discussion

A. The species of the family Aphididae harmful to pome and stone fruit trees

A list, indicating the host and aphid species in this region are given below.

Prunus armeniaca L.	:	*Hyalopterus pruni* (Geoffroy) *Myzus persicae* (Sulzer)
Prunus avium L.	:	*Myzus cerasi* (Fabricius)
Prunus cerasifera Ehrh.	:	*Brachycaudus helichyrsi* (Kaltenbach) *Hyalopterus pruni* *Myzus persicae*
Prunus domestica L.	:	*Brachycaudus helichrysi* *Brachycaudus persicae* Passerini *Hyalopterus pruni* *Macrosiphum euphorbiae* Thomas *Myzus persicae* *Rhopalosiphum nympheae* (Linnaeus)
Prunus insitita L.	:	*Brachycaudus helichrysi* *Hyalopterus pruni* *Myzus persicae*
Prunus mahaleb L.	:	*Myzus lythri* (Schrank)
Prunus persica S. et Z.	:	*Brachycaudus prunicola* Kaltenbach *Hyalopterus pruni* *Myzus persicae*
Prunus salicina L.	:	*Brachycaudus helichrysi* *Myzus persicae* *Rhopalosiphum nympheae*
Malus communis L.	:	*Aphis pomi* De Geer *Dysaphis plantaginea* (Passerini)
Pyrus communis L.	:	*Dysaphis pyri* (Boyer de Fonscolombe)
Pyrus elaeagrifolia Pall	:	*Dysaphis pyri*

B. The parasites of the species of the family Aphididae harmful to pome and stone fruit trees

In course of the study some parasitic species which belong to the family Aphidiidae and Pteromalidae (Hymenoptera) are observed.

The group of aphidiids are the primary parasites of aphids and they are in solitary character. Parasited aphids become mummify on the host plant in various colour depending to the group of parasite.

Aphidius colemani Viereck, *A. matricariae* Haliday, *Ephedrus persicae* Froggatt, *Trioxys angelicae* (Haliday), *Diaeritiella rapae* (M'Intosh), and *Lysiphlebus fabarum* (Marshall) are found by this study as primer parasites of aphids in family Aphidiidae.

Ephedrus persicae seems to be more diffusible than the others in the region. *L. fabarum* is found from the *H. pruni* only in Bornova and Menemen but the others can meet all over the region. The aphidiids are founded during this study infest many aphid species and seem as more widely specialized parasite exept *A. colemani*. It is founded only from *H. pruni* as like Middle-Asia and Russia.

Although, the efficiency of the aphidiid species was obstructed by some factors but they seemed to active in some localities. *Aphidius colemani* and *Aphidius matricariae* are recorded first time in Turkey. Their proportions in the general parasitism of aphids are given in Table 1.

It is necessary to mention that the species of Pteromalidae are the hyperparasites of the aphids and infest some syrphid larvae. So they are not desired in biological control programs.

Pachyneuron aphidis (Bouché), *P. formosum* Walker and *Asaphes vulgaris* Walker are found during this study as a seconder parasites of aphids in the family Pteromalidae. But they are not widely-spread. Their distribution and hosts are given in Table 2 and 3.

C. The predators of the species of the family Aphididae harmful to pome and stone fruit trees

Nine families in 4 orders and their related 51 species of 29 genera were identified as the predators of the Aphididae family.

Anthocoris nemoralis (Fabricius), *Orius minutus* (Linnaeus), *O. laevigatus* (Fieber) (Anthocoridae), *Deraeocoris schach* (Fabricius), *D. serenus* Douglas and Scott, *D. rutilus* (Herrich-Schaeffer), *D. ruber* (Linnaeus), *D. trifasciatus* (Linnaeus), *Pilophorus pusillus* Reuter, *Phytocoris longipennis* Flor, *Atractotomus mali* (Meyer-Duer) (Miridae) and *Nagusta goedeli* (Kolenati) (Reduviidae) are the predator species belong the order Heteroptera.

A. nemoralis and *O. minutus* are widely distributed in the region and obtained as a common predator of aphids. In this study totally 107 and 67 specimens were collected respectively.

Deraeocoris spp. found in this study observed as speedly consume especially the aphids and seem effective. Our opinion is this species can be use as a agent of biological control against aphids. But generally they are polyphag so that they can not control aphid population alone.

The other species in this order are in small numbers. Their distribution and hosts are given in Table 2 and 3.

On the other hand *Phytocoris longipennis* identified during this study is among the recently found species in Turkey.

Anisochrysa carnea (Stephens), *Chrysopa dubitans* Mc Lachlan *C. septempuctata* Wesmael, *C. formosa* Brauer (Chrysopidae) and *Wesmaelius subnebulosus* (Stephens) (Hemerobiidae) are the predator species belong to Neuroptera.

These predators do not widely spread and their population levels are found so low in this region. *A. carnea* seems to be more common than the others. In this study totally 33 specimens were collected from the pome and stone fruit trees. There are some factors that limited their population and effectiveness. One of them is their hymenopter parasite in all stages as recorded by New (1975). But they can be use in glasshouses for controling aphids and Acarina.

The coccinellids seemed to be only predators of aphids from Coleoptera. In total, 11 genera and their related 22 species were found in the course of study. These are: *Synharmonia conglobata* (Linnaeus), *Adalia bipunctata* (Linnaeus), *A. decempunctata* (Linnaeus), *A. fasciatopunctata revelierei* (Mulsant), *Coccinella septempunctata* Linnaeus, *C. undecimpunctata* Linnaeus, *Adonia variegata* (Goeze), *Exochomus quadripustulatus* (Linnaeus)), *E. nigromaculatus* (Goeze), *Harmonia quadripunctata* (Pontoppidan), *Propylaea quatuordecimpunctata* (Linnaeus), *Platynaspis luteorubra* (Goeze), *Semiadalia undecimnotata* (Scheider), *Calvia quatuordecimguttata* (Linnaeus), *Scymnus subvillosus* (Goeze), *S. syriacus* (Marseul), *S. apetzi* (Mulsant), *S. rubromaculatus* (Goeze), *S. apetzoides* (Capret and Fürsch), *S. interruptus* (Goeze), *S. quadriguttatus* (Fürsch and Kreissl) and *S. marginalis* (Rossi).

S. conglobata, A. bipunctata, S. subvillosus and *S. syriacus* are observed as the most promising species among of them. They were collected totally 155, 115, 381, 96 specimens respectively. This species are seemed widely distributed in the region and considered as common and effective predator of aphids. They are gluttonously feeding on these pests. But some ecological factors limit their effectiveness. *C. septempunctata, A. variegata* and *A. fasciatopunctata revelierei* are occasionally met on the pome and stone fruit trees. But they are unneglecting species in the coccinellid predator. The

others are very occasionally observed in small numbers. Among these *Calvia quatuordecimguttata* is first record in Turkey.

Their distribution and hosts are given in Table 2 and 3.

On the other hand, the experiments under the laboratory condition with *C. septempunctata* and *A. variegata* to bring into light the functional response of these species have shown that the predators can consume on averagely 6074 and 2544 *M. persicae* in different stages through out their life, respectively.

As for the order of Diptera is concerned 8 genera and 12 species belonging to the families Syrphidae, Cecidomyiidae and Chamaemyiidae were observed to be aphid predators. Some of them seemed to be able to conrol aphid population under favourable conditions. They are :

Episyrphus balteatus (De Geer), *E. auricollis* (Meigen), *Syrphus vitripennis* Meigen, *Metasyrphus corallae* (Fabricius), *M. luniger* (Meigen), *Scaeva selenitica* (Meigen), *S. pyrastri* (Linnaeus), *Paragus nigellus* Goeldlin, *P. majoranae* Rondani, *Sphaerophoria reuppelli* (Wiedemann) (Syrphidae), *Aphidoletes aphidimyza* (Rondani) (Cecidomyiidae), *Leucopis grisiola* (Fallen) (Chemaemyiidae).

The great majority of Syrphidae are predaceous upon the aphids. Many aphids in different stages are consumed by a single larva during its development. But population of this predator is so low in the nature. Because, many ecological factors limit their activity. If there is larva-pupa parasite of them their effectiveness become minumum.

In this study *E. balteatus, E. auricollis, M. corallae* and *S. vitripennis* are seemed widely-spread and more effective. They are collected as 102, 102, 59 and 56 during this study, respectively.

There is a opinion that they can be control aphid population in glasshouses as a biological control agent.

The other species are observed in small numbers and occur very occasionally.

Among of them, *Paragus nigellus* is the first record for the world while *Paragus majoranae* and *Episyrphus auricollis* identified during this study are the first records in Turkey.

Feeding experiments with *E. balteatus* reveal that up to 750 *M. persicae* in different stages are consumed by a single larva during its development. The larvae of this species could survive for 13 days on average and if scarcity of aphid they prolong their larval stage.

The cecidomyiid predator *Aphidoletes aphidimyza* are collected as 331 specimens during this study. It seems widely distributed and common predator of aphis. But their life cycle is short and capacity of reproduction is little. However, as records of many investigator they can be use as a biological control agent against aphids in glasshouses.

The chamaemyiid predator *Leucopis grisiola* was founded during this study as an effective enemy of aphids. This species was collected as 200 specimens and observed wiedly distributed in the region.

Their larvae consume the aphids speedly. Our opinion is this species can be use as a agent of biological control against aphids with the other natural enemies especially in glasshouses.

Distribution and hosts of all predator dipters founded during this study are given in Table 2 and 3.

On the other hand the larva-pupa parasite of some syrphid species *Diplazon laetatorius* F. (Hym., Ichneumonidae) was founded during this investigation. It occasionally occurs in small numbers. Course of this study 40 specimens were collected from syrphid pupae. In some places they considerably limits the syrphid activity. Bodenheimer and Swirski (1957) recorded that this species can infest the syrphid population by 20 %. So they are not desired in biological control programs. Its distribution and hosts are given in Table 2 and 3.

Table 1

The proportions in the general parasitism of the primary parasites of aphids found in Izmir and surrounding

Place	Date	Species of aphids	General parasitism %	The proportions in the general parasitism of the parasites %					
				A. colemani	*A. matricariae*	*E. persicae*	*T. angelicae*	*D. rapae*	*L. fabarum*
Bornova	12.5.1976	*M. cerasi*	13.27	—	100	—	—	—	—
	27.3.1978	*B. helichrysi*	12.72	—	19.04	33.33	—	47.63	—
		H. pruni	2.50	—	—	—	—	—	100
		M. persicae	1.12	—	—	—	—	100	—
	12.4.1978	*D. pyri*	18.00	—	23.53	20.00	—	56.47	—
		B. helichrysi	2.99	—	54.54	—	—	45.46	—
	25.4.1978	*D. pyri*	1.90	—	30.77	38.46	—	30.77	—
	18.5.1978	*H. pruni*	4.00	100	—	—	—	—	—
	31.5.1979	*D. pyri*	6.80	—	—	—	100	—	—
		H. pruni	7.14	100	—	—	—	—	—
		M. cerasi	22.06	—	—	—	100	—	—
	6.6.1979	*H. pruni*	58.30	93.87	—	—	—	6.13	—
Çeşme	11.6.1976	*H. pruni*	8.75	100	—	—	—	—	—

Table 1 (Continued)

Dikili	7.7.1976	*H. pruni*	11.68	53.27	—	17.76	28.97	—	—
Karşıyaka	22.5.1976	*H. pruni*	8.38	46.38	—	—	15.94	37.68	—
	19.6.1977	*B. helichrysi*	5.83	—	20.58	52.95	26.47	—	—
	12.4.1978	*D. pyri*	17.47	—	19.15	46.81	12.76	21.28	—
		B. helichrysi	2.10	—	38.88	44.44	—	16.68	—
	31.5.1979	*H. pruni*	13.34	100	—	—	—	—	—
		H. pruni	6.96	—	—	—	100	—	—
	17.6.1979	*M. persicae*	2.08	—	—	—	—	100	—
Kemalpaşa	8.5.1976	*M. cerasi*	28.84	—	68.48	—	31.52	—	—
	12.4.1978	*B. helichrysi*	1.16	—	57.15	42.85	—	—	—
	25.5.1978	*M. cerasi*	1.62	—	57.15	42.85	—	—	—
Menemen	31.5.1979	*H. pruni*	1.04	—	—	—	—	—	100
Central	27.3.1978	*B. helichrysi*	7.38	—	28.76	52.05	—	19.19	—
province	25.5.1978	*D. pyri*	10.28	—	—	100	—	—	—
	31.5.1978	*D. plantaginea*	6.45	—	—	100	—	—	—
	12.7.1978	*H. pruni*	2.45	75.48	24.52	—	—	—	—
	16.4.1979	*H. pruni*	2.54	—	12.50	87.50	—	—	—
Ödemiş	4.5.1976	*H. pruni*	8.93	58.06	—	25.80	—	16.14	—
	12.7.1978	*A. pomi*	8.14	—	—	—	100	—	—
Seferihisar	18.4.1979	*D. pyri*	26.55	—	—	88.88	—	11.12	—
		H. pruni	11.23	100	—	—	—	—	—
Tire	16.4.1979	*H. pruni*	2.54	—	12.50	87.50	—	—	—
Urla	18.4.1978	*B. helichrysi*	2.48	—	—	100	—	—	—

Table 2

Parasite and predator list of Aphididae and their distribution in Izmir and surrounding

	Bayındır	Bergama	Bornova	Çeşme	Dikili	Foça	Karşıyaka	Kemalpaşa	Kiraz	Karaburun	Menemen	Central Province	Ödemiş	Seferihisar	Selçuk	Tire	Torbalı	Urla
PARASITE																		
*Aphidius colemani** (Hym., Aphidiidae)			+	+	+		+					+	+	+				
*Aphidius matricarie**			+				+	+				+				+		
Ephedrus persicae			+		+		+	+				+	+	+		+		+
Trioxys angelicae			+		+		+	+					+					
Diaeritiella rapae			+				+					+	+	+				
Lysiphlebus fabarum			+								+							
Pachyneuron aphidis (Hym., Pteromalidae)			+				+					+						
Pachyneuron formosum			+									+		+				
Asaphes vulgaris			+				+	+				+						
PREDATOR																		
Anthocoris nemoralis (Het., Anthocoridae)			+				+	+				+	+	+				

Table 2 (Continued)

Orius minutus			+				+				+	+	+				+	
Orius laevigatus			+															
Deraeocoris schach (Het., Miridae)		+	+	+	+		+	+	+		+	+	+	+	+		+	+
Deraeocoris serenus		+	+	+		+				+	+	+	+			+	+	+
Deraeocoris rutilus			+				+	+			+	+				+		+
Deraeocoris ruber							+											
Deraeocoris trifasciatus												+						
Pilophorus pusillus			+	+	+			+				+	+		+			
*Phytocoris longipennis**							+											
Atractotomus mali	+		+				+	+				+						
Nagusta goedeli (Het., Reduviidae)			+				+										+	
Anisochrysa carnea (Neup., Chrysopidae)		+	+		+	+	+	+	+	+	+	+	+	+		+		
Chrysopa dubitans		+	+	+	+	+	+		+	+			+	+		+		
Chrysopa septempunctata			+					+								+		
Chrysopa formosa																+		
Wesmaelius subnebulosus (Neur., Hemorobiidae)			+				+					+	+					
Synharmonia conglobata (Col., Coccinellidae)	+	+	+	+	+	+	+	+			+	+	+	+		+		
Adalia bipunctata	+	+	+	+	+	+	+	+			+	+	+	+		+		
Adalia decempunctata			+				+	+				+	+					+

* *New record for Turkey*

** *New species for Science*

Table 2 (Continued)

	Bayındır	Bergama	Bornova	Çeşme	Dikili	Foça	Karşıyaka	Kemalpaşa	Kiraz	Karaburun	Menemen	Central Province	Ödemiş	Seferihisar	Selçuk	Tire	Torbalı	Urla
Adalia fasciatopunctata revelierei		+	+	+	+		+	+				+	+	+		+	+	
Coccinella septempunctata	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+
Coccinella undecimpunctata				+														+
Adonia variegata	+		+		+						+	+	+			+		+
Exochomus quadripustulatus			+				+					+				+		
Exchomus nigromaculatus				+			+											
Harmonia quadripunctata			+				+											
Propylaea quatuordecimpunctata					+		+									+		
Platynaspis luteorubra												+						
Semiadalia undecimnotata																+		
*Calvia quatuordecimguttata**					+													
Scymnus subvillosus	+		+	+	+		+	+			+	+	+	+		+	+	+
Scymnus syriacus			+		+	+	+	+			+	+	+			+		
Scymnus apetzi			+				+					+	+			+		

Table 2 (Continued)

Scymnus rubromaculatus		+		+		+			+	+	+			+	
Scymnus apetzoides									+						
Scymnus interruptus			+		+										
Scymnus quadriguttatus						+								+	
Scymnus marginalis			+												
Episyrphus balteatus (Dip., Syriphidae)			+			+	+	+	+	+	+	+	+	+	+
*Episyrphus auricollis**			+			+	+			+	+				
Syrphus vitripennis			+	+		+	+		+	+	+			+	
Metasyrphus corallae			+			+	+		+	+	+			+	
Metasyrphus luniger			+			+				+					
Scaeva selenitica			+			+	+			+					
Scaeva pyrastri			+			+	+								
*Paragus nigellus***				+											
*Paragus majoranae**			+												
Sphaerophoria rueppelli						+	+								
Aphidoletes aphidimyza (Dip., Cecidomyiidae)	+	+	+	+		+	+		+	+	+	+	+	+	
Leucopis grisiola (Dip., Chamaemyiidae)			+			+	+		+	+	+	+		+	+
Diplazon laetatorius (Hym., Ichneumonidae)			+			+	+		+	+	+	+			

Table 3

Parasite and predator list of Aphididae found in Izmir and surrounding

	A. pomi	*B. helichrysi*	*B. persicae*	*B. prunicola*	*D. plantaginea*	*D. pyri*	*H. pruni*	*M. euphorbiae*	*M. cerasi*	*M. lythri*	*M. persicae*	*R. nympheae*
PARASITE												
Aphidius colemani (Hym., Aphidiidae)							+					
Aphidius matricariae		+				+	+		+		+	
Ephedrus persicae		+			+	+	+		+		+	
Trioxys angelicae	+	+				+	+		+			
Diaeritiella rapae		+				+	+				+	
Lysiphlebus fabarum							+					
Pachyneuron aphidis (Hym., Pteromalidae)							+				+	
Pachyneuron formosum		+				+						
Asaphes vulgaris		+					+		+		+	
PREDATOR												
Anthocoris nemoralis (Het., Anthocoridae)		+				+	+			+	+	

Table 3 (Continued)

Orius minutus		+			+		+	+
Orius laevigatus							+	
Deraeocoris schach (Het., Miridae)				+	+		+	
Deraeocoris serenus					+		+	
Deraeocoris rutilus				+			+	
Deraeocoris ruber		+			+			
Deraeocoris trifasciatus				+				
Pilophorus pusillus	+			+	+	+		
Phytocoris longipennis					+			
Atractotomus mali		+		+				
Nagusta goedeli (Het., Reduviidae)					+			
Anisochrysa carnea (Neur., Chrysopidae)		+	+		+			+
Chrysopa dubitans					+			
Chrysopa septempunctata					+			
Chrysopa formosa								+
Wesmaelius subnebulosus (Neur., Hemerobiidae)		+			+			+
Synharmonia conglobata (Col., Coccinellidae)		+		+	+		+	+
Adalia bipunctata	+	+		+	+	+	+	+
Adalia decempunctata		+		+	+		+	+
Adalia fasciatopunctata revelierei		+		+	+	+	+	+
Coccinell$_a$ septempunctata		+		+	+		+	+
Coccinella undecimpunctata					+			+

Table 3 (Continued)

	A. pomi	*B. helichrysi*	*B. persicae*	*B. prunicola*	*D. plantaginea*	*D. pyri*	*H. pruni*	*M. euphorbiae*	*M. cerasi*	*M. lythri*	*M. persicae*	*R. nymphaeae*
Adonia variegata							+			+	+	
Exochomus quadripustulatus						+	+				+	
Exochomus nigromaculatus							+				+	
Harmonia quadripunctat$_a$		+				+	+			+		
Propylaea quatuordecimpunctata		+		+			+					
Platynaspis luteorubra							+				+	
Semiadalia undecimnotata							+					
Calvia quatuordecimguttata							+					
Scymnus subvillosus	+	+	+	+	+	+	+			+	+	+
Scymnus syriacus		+		+			+			+	+	
Scymnus apetzi		+					+			+	+	
Scymnus rubromaculatus		+			+		+				+	
Scymnus apetzoides							+					
Scymnus interruptus							+			+		
Scymnus quadriguttatus							+				+	
Scymnus marginalis							+					

Table 3 (Continued)

Episyrphus balteatus (Dip., Syrphidae)	+		+		+	+			+	+		
Episyrphus auricollis	+				+	+				+		
Syrphus vitripennis	+					+			+	+		
Metasyrphus corallae	+				+		+		+	+		
Metasyrphus luniger	+				+	+				+		
Scaeva selenitica	+				+			+		+		
Scaeva pyrastri	+								+			
Paragus nigellus			+									
Paragus majoranae	+	+										+
Sphaerophoria rueppelli									+	+		
Aphidoletes aphidimyza (Dip., Cecidomyiidae)	+		+	+	+	+			+	+		
Leucopis grisiola (Dip., Chamaemyiidae)	+				+	+			+	+		
Diplazon laetatorius (Hym., Ichneumonidae)	***S. vitripennis, E. balteatus, M. corallae, M. luniger, S. selenitica***											

Özet

İzmir ili ve çevresinde taş ve yumuşak çekirdekli meyve ağaçlarında zararlı Aphididae (Homoptera) türlerinin doğal düşmanları, konukçuları, yayılışları ve önemlilerinin etkililik durumları üzerinde araştırmalar

İzmir ili ve çevresinde 1976-1979 yılları arasında yapılan bu çalışmada, taş ve yumuşak çekirdekli meyve ağaçlarında zararlı Aphididae familyasından 7 cinse ait 12 tür saptanmıştır.

Bu zararlıların primer parazitleri olarak Aphidiidae (Hymenoptera) familyasından 5 cinse ait 6 tür bulunmuş olup **Aphidius colemani** Viereck ve **Aphidius matricariae** Haliday Türkiye faunası için yeni türlerdir.

Hyperparazit karakterli sekonder parazitleri olarak da Pteromalidae familyasından 2 cinse ait 3 tür bulunmuştur.

Çalışma süresince bitki bitlerinin predatörü olarak 4 takıma bağlı 9 familya içinde 51 tür saptanmıştır. Bunlar arasında **Paragus nigellus** Goedlin dünya, **Phytocoris longipennis** Flor, **Calvia quatuordecimguttata** (Linnaeus), **Paragus majoranae** Rondani ve **Episyrphus auricollis** (Meigen) Türkiye faunası için yeni kayıt niteliğindedir.

Çalışma sırasında bazı syrphid türlerinin larva-pupa paraziti olarak da **Diplazon laetatorius** F. (Hym., Ichneumonidae)'a rastlanmıştır.

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