

# The Species of Deltocephalinae (Homoptera: Auchenorrhyncha: Cicadellidae) found in the Middle and East Black Sea Regions

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## Summary

To find the species belonging to the subfamily Deltocephalinae distributed in Middle and East Black Sea Regions, 11140 adult samples were collected. Samples were prepared, observed and identified. It was found that 89 species belonging to 44 genera and 9 tribe of the Deltocephalinae were distributed in the regions. Two of them, *Selenocephalus conspersus* (Herrich-Schaffer, 1834) and *Psammotettix poecilus* (Flor, 1861) were found to be new records for the Deltocephalinae fauna of Turkey.

**Key words:** Homoptera, Cicadellidae, Deltocephalinae, Middle and East Black Sea, Turkey.

**Anahtar sözcükler:** Homoptera, Cicadellidae, Deltocephalinae, Orta ve Doğu Karadeniz, Türkiye.

## Introduction

Deltocephalinae is a subfamily of the Cicadellidae (Homoptera) which has the greatest species number (Nast, 1972). The species belonging to this subfamily exist on plants as intensive populations. They damage plants sucking the saps and

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spreading causative agents of plant diseases. The studies on Deltocephalinae in Turkey were started by Fahringer (1922) and continued by Zachvatkin (1937, 1946), Dlabola (1957, 1971a, b, 1974, 1979, 1980a, b, 1981, 1985, 1987), Linnavuori (1965), Nast (1972), Kalkandelen (1974), Lodos and Kalkandelen (1985a, b, c, 1986a, b, c, 1987a, b, c, d, 1988), Kartal (1981, 1983), Abdul-Nour (1988), Başıpınar and Uygun (1991a, b, 1992a, b), Güçlü and Özbek (1994a, b, c, d; 1995a, b).

Lodos and Kalkandelen (1985a, b, c; 1986a, b, c; 1987a, b, c, d ; 1988) were reported the list of the species belonging to Deltocephalinae of Turkey. According to this list, it was found that 37 species belonging to 28 genera were distributed in the Middle and Eastern Black Sea regions.

Kartal and Zeybekoğlu, in the studies they performed in the Middle Black Sea region (1990, 1991, 1992; 1994a, b, c; 1996; 1997), were made the description of a new species and reported 10 species as new records for the fauna of the Turkey. In these studies, it were also reported that 48 species belonging to 30 genera were distributed in this region and the taxonomic characteristics of each species were investigated. In these investigations, Zeybekoğlu (1993, 1994, 1996) was also reported that 10 species belonging to 3 genera were distributed in the Middle Black Sea region and the taxonomic characteristics of each species were also investigated.

For control against economically important insects belonging to Deltocephalinae, it is primarily important to determine the species. Before this study, there had been a few study existed and these studies were not comprehensive enough to understand the distribution of the Deltocephalinae members in the region. Therefore, this study was carried out to find the species of Deltocephalinae in the regions and so to make contributions to the fauna of Turkey.

## **Material and Method**

From the Middle and East Black Sea regions (Sinop, Samsun, Amasya, Ordu, Tokat, Giresun, Trabzon, Rize, Artvin), 11140 samples belonging to Deltocephalinae were collected over a period from 1986 to 1994 as research material. These samples were prepared according to standard preparation methods to be ready for further investigations. The species existed in the research area were identified comparing the taxonomic characteristics of the samples to the taxonomic characteristics given for Deltocephalinae in the literature as follows: Melichar (1914), Lindberg (1948), Ribaut (1952), Emeljanov (1964), Ossiannilsson (1983), Dlabola (1957, 1974, 1980a, b, 1981), Remane (1961), Kalkandelen (1974), Logvinenko (1975), Schulz (1976), Kartal (1981, 1983), Abdul-Nour (1987). Identified species and collection localities of the samples were indicated in the Table 1.

Table 1. Species, the number and localities of samples.

Subfamily: Deltocephalinae Fieber, 1869.

Tribe	Species	Total Sample Number	Amasya	Artvin	Giresun	Ordu	Rize	Samsun	Sinop	Tokat	Trabzon
Gryopotini Evans, 1947	<i>Grypotes puncticollis</i> (Herrich-Schaffer, 1834)	67 ♂♂, 80 ♀♀	+		+		+	+			
	<i>Grypotes staurus</i> Ivanoff, 1885	74 ♂♂, 98 ♀♀						+	+		
Goniagnathini Wagner, 1951	<i>Goniagnathus brevis</i> (Herrich-Schaffer, 1835)	76 ♂♂, 81 ♀♀	+					+	+	+	
Opsini Emeljanov, 1961	<i>Opsius stactogalus</i> Fieber, 1866	53 ♂♂, 63 ♀♀						+	+		
	<i>Neocaliturus fenestratus</i> (Herrich-Schaffer, 1834)	111 ♂♂, 138 ♀♀	+	+	+			+	+	+	
Macrostelini Kirkaldy, 1906	<i>Irinula erythrocephala</i> (Ferrari, 1882)	28 ♂♂, 34 ♀♀	+							+	
	<i>Balclutha punctata</i> (Fabricius, 1775)	166 ♂♂, 215 ♀♀	+	+	+	+	+	+	+		+
	<i>Macrosteles forficula</i> (Ribaut, 1927)	43 ♂♂, 50 ♀♀	+					+	+		
	<i>Macrosteles frontalis</i> (Scott, 1875)	32 ♂♂, 39 ♀♀						+	+		
	<i>Macrosteles horvathi</i> (Wagner, 1935)	34 ♂♂, 38 ♀♀	+					+	+		
	<i>Macrosteles laevis</i> (Ribaut, 1927)	100 ♂♂, 127 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Macrosteles quadripunctulatus</i> (Kirschbaum, 1868)	49 ♂♂, 53 ♀♀	+		+			+			
	<i>Macrosteles sexnotatus</i> (Fallen, 1806)	85 ♂♂, 107 ♀♀	+	+	+	+	+	+	+	+	+
Deltocephalini Fieber, 1869	<i>Deltocephalus maculiceps</i> Boheman, 1847	27 ♂♂, 34 ♀♀		+	+						
	<i>Deltocephalus pulicaris</i> (Fallen, 1806)	87 ♂♂, 114 ♀♀	+		+			+	+	+	
	<i>Recilia coronifera</i> (Marshall, 1866)	31 ♂♂, 33 ♀♀	+		+			+	+		
	<i>Recilia schmidtgeni</i> (Wagner, 1939)	30 ♂♂, 32 ♀♀						+	+	+	
Doraturini Ribaut, 1952	<i>Chiasmus conspurcatus</i> (Perris, 1857)	23 ♂♂, 22 ♀♀	+						+	+	
	<i>Doratura concors</i> Horvath, 1903	31 ♂♂, 35 ♀♀						+	+		
	<i>Doratura homophyla</i> (Flor, 1861)	33 ♂♂, 35 ♀♀	+						+		
	<i>Doratura stylata</i> (Boheman, 1847)	41 ♂♂, 47 ♀♀	+		+			+	+	+	
Fieberellini Wagner, 1951	<i>Fieberiella florii</i> (Stal, 1864)	88 ♂♂, 91 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Fieberiella lugubris</i> Emeljanov, 1964	21 ♂♂, 22 ♀♀								+	
	<i>Synophropsis lauri</i> (Horvath, 1897)	35 ♂♂, 39 ♀♀	+					+	+	+	
Athysanini VanDuzee, 1892	<i>Osbornellus macchiai</i> Ball, 1932	22 ♂♂, 21 ♀♀	+								
	<i>Platymetopius guttatus</i> Fieber, 1869	27 ♂♂, 34 ♀♀	+		+			+	+	+	+
	<i>Platymetopius hannelorae</i> Abdul-Nour, 1987	12 ♂♂, 12 ♀♀						+		+	
	<i>Platymetopius major</i> (Kirschbaum, 1868)	33 ♂♂, 36 ♀♀	+		+			+	+		
	<i>Platymetopius manfredei</i> Abdul-Nour, 1987	12 ♂♂, 11 ♀♀								+	
	<i>Platymetopius obsoletus</i> (Signoret, 1880)	25 ♂♂, 30 ♀♀						+			
	<i>Platymetopius rostratus</i> (Herrich-Schaffer, 1834)	33 ♂♂, 34 ♀♀								+	+
	<i>Anoplotettix fuscovenosus</i> (Ferrari, 1882)	30 ♂♂, 31 ♀♀					+		+	+	
	<i>Anoplotettix sahtyancii</i> Dlabola, 1970	15 ♂♂, 18 ♀♀		+							
	<i>Idiodonus cruentatus</i> (Panzer, 1799)	30 ♂♂, 31 ♀♀	+		+			+			
	<i>Allygus maculatus</i> Ribaut, 1948	22 ♂♂, 10 ♀♀	+							+	
	<i>Allygidius atomarius</i> Fabricius, 1794	33 ♂♂, 30 ♀♀							+	+	
	<i>Allygidius nihati</i> Kartal-Zeybekoğlu, 1994	8 ♂♂, 11 ♀♀							+		
	<i>Phlepsius intricatus</i> (Herrich-Schaffer, 1838)	22 ♂♂, 26 ♀♀	+					+			+
	<i>Phlepsius ornatus</i> (Perris, 1857)	37 ♂♂, 26 ♀♀	+		+			+	+	+	+
	<i>Selenocephalus anatolicus</i> Dlabola, 1957	12 ♂♂, 11 ♀♀								+	
<i>Selenocephalus ankarae</i> Dlabola, 1957	15 ♂♂, 17 ♀♀									+	

(Table 1 continued)

Tribe	Species	Total Sample Number	Anasya	Artvin	Giresun	Ordu	Rize	Samsun	Sinop	Tokat	Trabzon
	<i>Selenocephalus armeniacus</i> Lindberg, 1960	26 ♂♂, 28 ♀♀	+			+		+		+	
	<i>Selenocephalus conspersus</i> (Herrich-Schaffer, 1834)*	13 ♂♂, 16 ♀♀									+
	<i>Selenocephalus obsoletus</i> (Germer, 1817)	36 ♂♂, 42 ♀♀	+	+		+		+		+	
	<i>Selenocephalus pallidus</i> Kirschbaum, 1868	47 ♂♂, 59 ♀♀	+	+		+		+	+	+	+
	<i>Hardya anatolica</i> Zachvatkin, 1946	14 ♂♂, 18 ♀♀		+						+	+
	<i>Eohardya fraudulenta</i> (Horvath, 1903)	36 ♂♂, 42 ♀♀						+	+	+	
	<i>Elymana sulphurella</i> (Zetterstedt, 1828)	26 ♂♂, 28 ♀♀				+			+		
	<i>Cicadula frontalis</i> (Herrich-Schaffer, 1835)	12 ♂♂, 11 ♀♀				+		+			
	<i>Cicadula quadrinotata</i> (Fabricius, 1794)	41 ♂♂, 50 ♀♀				+		+	+		
	<i>Mocydia aegae</i> Abdul-Nour, 1988	23 ♂♂, 27 ♀♀	+					+	+		
	<i>Mocydia crocea</i> (Herrich-Schaffer, 1837)	156 ♂♂, 201 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Mocydia spiculum</i> Abdul-Nour, 1986	21 ♂♂, 23 ♀♀	+					+	+	+	
	<i>Mocydiopsis longicauda</i> Remane, 1961	26 ♂♂, 29 ♀♀						+	+		
	<i>Mocydiopsis parvicauda</i> Ribaut, 1939	57 ♂♂, 65 ♀♀	+					+	+	+	
	<i>Speudotettix subfuscus</i> (Fallen, 1806)	49 ♂♂, 57 ♀♀						+	+		
	<i>Thamnotettix creticus</i> Dlabola, 1974	132 ♂♂, 172 ♀♀						+		+	
	<i>Thamnotettix diluitor</i> (Kirschbaum, 1868)	52 ♂♂, 61 ♀♀						+			
	<i>Thamnotettix exemtus</i> Melichar, 1896	30 ♂♂, 33 ♀♀						+	+	+	
	<i>Thamnotettix thrax</i> Dlabola, 1965	125 ♂♂, 115 ♀♀				+		+	+		
	<i>Pithyotettix abietinus</i> (Fallen, 1806)	12 ♂♂, 11 ♀♀				+					
	<i>Handianus procerus</i> (Herrich-Schaffer, 1835)	28 ♂♂, 31 ♀♀				+				+	
	<i>Scleroracus decumanus</i> (Kontkanen, 1949)	15 ♂♂, 14 ♀♀								+	
	<i>Limotettix sphagneticus</i> Emelianov, 1964	44 ♂♂, 36 ♀♀						+			
	<i>Limotettix striola</i> (Fallen, 1806)	36 ♂♂, 33 ♀♀	+			+		+	+		
	<i>Laburrus handlirschi</i> (Matsumura, 1908)	7 ♂♂, 8 ♀♀								+	
	<i>Conosanus obsoletus</i> (Kirschbaum, 1858)	52 ♂♂, 65 ♀♀	+			+		+	+	+	
	<i>Euscelis lineolatus</i> Brulle, 1832	280 ♂♂, 324 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Streptanus josifovi</i> Dlabola, 1957	8 ♂♂, 6 ♀♀						+			
	<i>Artianus manderstjernii</i> (Kirschbaum, 1868)	18 ♂♂, 20 ♀♀	+	+		+		+	+	+	+
Paralimnini Distant, 1908	<i>Arocephalus languidus</i> (Flor, 1861)	13 ♂♂, 12 ♀♀	+								+
	<i>Arocephalus langiceps</i> (Kirschbaum, 1868)	95 ♂♂, 91 ♀♀	+					+	+		
	<i>Psamnotettix alienus</i> (Dahlbom, 1850)	230 ♂♂, 290 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Psamnotettix cephalotes</i> (Herrich-Schaffer, 1834)	12 ♂♂, 18 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Psamnotettix cerinus</i> (Lindberg, 1948)	16 ♂♂, 17 ♀♀	+					+	+		
	<i>Psamnotettix confinis</i> (Dahlbom, 1850)	640 ♂♂, 805 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Psamnotettix dubius</i> Ossiannilsson, 1974	28 ♂♂, 29 ♀♀	+			+			+	+	
	<i>Psamnotettix ornaticeps</i> (Horvath, 1897)	11 ♂♂, 14 ♀♀								+	
	<i>Psamnotettix poecilus</i> (Flor, 1861)*	12 ♂♂, 17 ♀♀								+	
	<i>Psamnotettix provincialis</i> (Ribaut, 1925)	341 ♂♂, 397 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Psamnotettix striatus</i> (Linnaeus, 1758)	240 ♂♂, 260 ♀♀	+	+	+	+	+	+	+	+	+
	<i>Ebarrius cognatus</i> (Fieber, 1869)	55 ♂♂, 70 ♀♀	+					+	+		
	<i>Adarrus multinotatus</i> (Boheman, 1847)	35 ♂♂, 41 ♀♀				+		+			
	<i>Jassargus obtusivalis</i> (Kirschbaum, 1868)	154 ♂♂, 220 ♀♀				+		+	+		
	<i>Jassargus repletus</i> (Fieber, 1869)	83 ♂♂, 108 ♀♀	+					+	+	+	
	<i>Diplocolenus bohemani</i> (Zetterstedt, 1840)	13 ♂♂, 8 ♀♀						+			
	<i>Diplocolenus bekiri</i> Kalkandelen, 1974	32 ♂♂, 38 ♀♀						+		+	
	<i>Mocuellus foxi</i> Kalkandelen, 1974	15 ♂♂, 16 ♀♀	+					+			

\* New records for the fauna of Turkey.

## Results and Discussion

Research samples were collected between April and November of each year over a period from 1986 to 1994. Identification of the samples showed that 89 species, included in 44 genera and 9 tribe of the subfamily Deltocephalinae, were distributed in Middle and East Black Sea regions. Names of species, the number of investigated samples and collection localities were indicated in Table 1.

Lodos and Kalkandelen (1985a, b, c; 1986a, b,c; 1987a, b, c, d, 1988) were reported that 37 species belonging to Deltocephalinae were distributed in the Middle and East Black Sea regions. In the Middle Black Sea region, the taxonomic characteristics of 48 species were investigated by Kartal and Zeybekoğlu (1990, 1991, 1992, 1994a, b, c, 1997), those of 10 species by Zeybekoğlu (1993, 1994, 1996).

As indicated in this study, 89 species of Deltocephalinae were distributed in the Middle and East Black Sea regions. Nine species, *Macrosteles laevis* (Ribaut, 1927), *M. viridigriseus* (Edwards, 1922), *Mocydia crocea* (Herrich - Schaffer, 1837), *Euscelis lineolatus* Brulle, 1832, *Psammotettix alienus* (Dahlbom, 1850), *P. cephalotes* (Herrich - Schaffer, 1834), *P. confinis* (Dahlbom, 1850), *P. provincialis* (Ribaut, 1925), *P. striatus* (Linnaeus, 1758), were distributed all over the research area. Five of these species, which were *E. lineolatus*, *P. alienus*, *P. confinis*, *P. provincialis*, *P. striatus*, were represented in research area as dense populations.

## Özet

### Orta ve Doğu Karadeniz Bölgesi'nde tesbit edilen Deltocephalinae (Homoptera: Auchenorrhyncha: Cicadellidae) türleri

Orta ve Doğu Karadeniz Bölgesi'nde dağılışı gösteren Deltocephalinae türlerini belirlemek amacı ile 1986-1994 yılları arasında 11140 adet ergin örnek toplanmıştır. Örnekler, preparasyonu yapılarak incelenmiş ve teşhisleri yapılmıştır. Deltocephalinae altfamilyası içerisindeki 9 tribus'a ait 44 cins içinde 89 türün dağılışı gösterdiği tesbit edilmiştir. Bunlardan *Selenocephalus conspersus* (Herrich-Schaffer, 1834) ve *Psammotettix poecilus* (Flor, 1861) Türkiye Deltocephalinae faunası için yeni kayıt olarak bildirilmiştir.

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