

ARAŞTIRMA MAKALESİ/RESEARCH ARTICLE

INVESTIGATIONS ON THE ASILIDAE (DIPTERA) FAUNA OF ESKİŞEHİR PROVINCE

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ABSTRACT

19 species of 5 subfamilies which belongs to Asilidae (2 for Stenopogoninae, 1 for Dasypogoninae, 1 for Leptogastrinae, 1 for Apocleinae and 14 species for Asilinae) were determined in this study performed in the Eskişehir province of Turkey. Of these determined species, *Acanthopleura pallida* Theodor 1980, *Machimus negevensis* Theodor 1980, *Machimus largus* Richter 1963, *Machimus rufostriatus* Theodor 1980 are new record for Turkey, which redescrptions are also given.

Key Words: Diptera, Asilidae, Fauna, Eskişehir, Turkey.

ESKİŞEHİR İLİ ASİLİDAE (DIPTERA) FAUNASI ÜZERİNE ARAŞTIRMALAR

ÖZ

Eskişehir İli'nde yapılmış bu çalışmayla Asilidae'den 5 altfamilyaya (Stenopogoninae'den 2, Dasypogoninae'den 1, Leptogastrinae'den 1, Apocleinae'den 1 ve Asilinae'den 14 tür) ait 19 tür tespit edilmiştir. Bunlardan 4 tür, *Acanthopleura pallida* Theodor 1980, *Machimus negevensis* Theodor 1980, *Machimus largus* Richter 1963 ve *Machimus rufostriatus* Theodor 1980, Türkiye için yeni kayıttır ve bu türlerin redeskripsionları verilmiştir.

Anahtar Kelimeler: Diptera, Asilidae, Fauna, Eskişehir, Türkiye.

1. INTRODUCTION

Predator insect groups are important in defense against agronomical harmful insects. Asilidae is one of the important groups of these predators in controlling numerous insect groups (Hull, 1962; Theodor, 1980). Asilidae is known to have 1634 species at Palearctic region (Geller-Grimm, 2001a). To date, 210 species are reported from Turkey (Giray, 1981; Hayat 1993, Weinberg and Hayat 1997; Hasbenli and Geller-Grimm, 1999; Bosak and Hradsky, 2001). By adding 16 species, the number of Asilidae species of Turkey has been increased to 214.

2. MATERIALS AND METHODS

The specimens were collected from 16 localities of Eskişehir; İnönü, Mihalgazi, Sarıcakaya, Seyitgazi, Sivrihisar and urban area of Eskişehir, in June, July and

August 1993, July 1996, July 1997, July 2000 and May, June and August of 2001.

Drawings were performed from the preperates of the male genitalia of the collected specimens and the identifications were done according to Séguy (1927), Engel (1930), Richter (1963, 1988), Tsacas (1968), Hayat (1993), Hull (1962), Theodor (1980), Weinberg (1987), and Hayat and Özbek (1999).

Abbreviations: T.: Town, V.:Village.

3. RESULTS

As a result of this investigation, 19 species were determined which belonged to the following subfamilies: 2 for Stenopogoninae, 1 for Dasypogoninae, 1 for Leptogastrinae, 1 for Apocleinae and 14 species for Asilinae. Of these species, 4 of them were new records for Turkey.

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Subfamily: STENOPOGONINAE**1. *Stenopogon laevigatus* (Loew, 1851)**

Syn: *Dasyopogon bicolor* Bigot, 1878

Length: 20-22 mm; Wings: 12-14 mm.

General Distribution: Afghanistan, Armenia, Greece, Iran, Russia (Caucasian) (Lehr, 1988; Richter, 1988).

Distribution in Turkey: Erzurum (Hayat, 1993); Ankara (Durmuş, 1999); Balıkesir, Bursa (Çalışkan, 2002); Adana, Bolu, Burdur, Isparta, Kütahya, Van (Bosak and Hradsky, 2001).

Examined material: Eskişehir (İnönü T.), 830 m, 13.08. 2001, 1 ♀, 2 ♂♂ (Figures 1-6).

2. *Stichopogon chrysostoma* Schiner, 1867

Syn: *Stichopogon lucidiventris* Becker, 1902

Length: 9-9,5 mm; Wings: 5-5,5 mm.

General Distribution: Cyprus, Egypt, Iran, Israel, Kazakhstan, Kyrgyzstan, Libya, Mongolia, Tajikistan, Turkmenistan, Uzbekistan (Lehr, 1988).

Distribution in Turkey: Erzurum (Hayat, 1993); Ankara (Durmuş, 1999); Bursa, Balıkesir, Çanakkale (Çalışkan, 2002).

Examined material: Eskişehir (İnönü, Pınarbaşı V.), 830 m, 13.08. 2001, 2 ♀♀, 3 ♂♂ (Figures 7-11).

Subfamily: DASYPOGONINAE**3. *Dasyopogon diadema* (Fabricius, 1871)**

Syn: *D. punctatus* (Fabricius, 1781); *D. bohemicus* (Preyssler, 1790); *D. analis* (Fabricius, 1794); *D. cylindrica* (Fabricius, 1794); *D. nervosus* Meigen, 1804; *D. liburnicus* Germar, 1817; *D. fasciatus* Meigen, 1820; *D. umbrosus* Brulle, 1832; *D. sicanus* (Costa, 1853); *D. rubidus* Hermann, 1906.

Length: 24-25,5 mm; Wings: 15-16,5 mm.

General Distribution: Albania, Austria, Bulgaria, Czech Republic, France, Germany, Great Britain, Greece, Hungary, Iran, Israel, Morocco, Poland, Rumania, Russia, Spain, Yugoslavia (Lehr, 1988).

Distribution in Turkey: İzmir, Muğla (Giray, 1981); Erzincan, Malatya, Muş (Hayat ve Özbek, 1999); Ankara (Durmuş, 1999).

Examined material: Eskişehir (Seyitgazi, Büyükyayla V.), 13/07/1997, 3 ♀♀, 3 ♂♂ (Figures 12-17).

Subfamily: LEPTOGASTRINAE**4. *Leptogaster cylindrica* (De Geer, 1776)**

Syn: *Asilus tipuloides* Fabricius, 1775; *Asilus livida* (Geoffren in Fauroray, 1785); *Leptogaster fusca*

Meigen, 1804; *L. nigricornis* Loew, 1847; *L. dorsalis* Dahlbom, 1851.

Length: 12-14 mm; Wings: 5-6 mm.

General Distribution: All palaeartic region (Lehr, 1988).

Distribution in Turkey: İstanbul (Janssens, 1968); Erzincan, Erzurum (Hayat, 1993); Ankara (Durmuş, 1999); Bitlis, Isparta, Kars, Kütahya, Van (Bosak and Hradsky, 2001); Balıkesir, Bursa (Çalışkan, 2002).

Examined material: Eskişehir: Muttalip V. 800 m, 28/07/1993, 3 ♀♀; 04/08/1993, 1 ♀, 1 ♂; 25/08/1993, 4 ♀♀, 3 ♂♂; 02/09/1993, 1 ♀, 22.07.1996, 1 ♀, 1 ♂ (Figures 18-20).

Subfamily: APOCLEINAE**5. *Promachus leoninus* Loew, 1848**

Length: 17-20 mm; Wings: 13-15 mm.

General Distribution: Armenia, Burma, Caucasian, Crimea, Georgia, Greece, Indian, Iran, Israel, Romania, Russia, Ukraine, Yugoslavia (Geller-Grimm, 2001 b).

Distribution in Turkey: Balıkesir (Janssens, 1968); Aydın, Muğla (Giray, 1981); Ankara (Durmuş, 1999); Adana, Adıyaman, Afyon, Antalya Denizli, Isparta, Mersin, (Bosak and Hradsky, 2001); Balıkesir, Çanakkale (Çalışkan, 2002).

Examined material: Eskişehir (Sarıcakaya, Mayıslar V.), 310 m, 09/08/2001, 1 ♂ (Figures 21-25).

Subfamily: ASILINAE**6. *Acanthopleura pallida* Theodor, 1980**

Syn: *Mochtherus goedli* Loew, 1854.

Length: 19 mm, Wings: 10 mm

Head: Face as wide as half of eye and with yellow tomentum. Antennae black; segment 1 slightly longer than segment 2; segment 3 slightly shorter than segment 1+2, flattened laterally and as wide as segment 2 at the middle; arista as long as segment 3.

Thorax: Mesonotum yellow with a dark brown median band and yellow setae dorsally. Mesopleuron with hairs at dorsal sides. Legs: red with yellow setae and covered with short yellow hairs; tibia with short black setae; at fore and middle legs, femur completely black in outer side; also tibia with a much fine black stripe in same side; basitarsus brown-red but others brown-black; hind legs, femur, tibia and basitarsus black in outer and lateral surface but red-brown inner surface, other tarsal segments brown-black.

Abdomen: Discal setae yellow. Posterior side of terga with yellow and brown fine band. Male genitalia red-brown.

General Distribution: Israel (Theodor, 1980).

Distribution in Turkey: First record from Turkey.

Examined material: Eskişehir (Karaşehir V.), 870m, 01.07.1997, 1 ♂ (Figures 26-30).

7. *Antiphriusson adpressus* Loew, 1849

Length: 19-21 mm; Wings: 9-11,5 mm.

General Distribution: Iran, Israel, Kazakhstan, Mısır, Russian (SSCB), Tunisia (Lehr, 1988).

Distribution in Turkey: Denizli (Lehr, 1988); Adıyaman, Kayseri, Kırşehir, Konya (Bosak and Hradsky, 2001); Balıkesir, Bursa, Çanakkale, (Çalışkan, 2002).

Examined material: Eskişehir (Çukurhisar), 850 m, 19/07/1993, 5 ♀♀, 2 ♂♂; 25/07/1993, 2 ♂♂ (Figures 31-35).

8. *Antiphriusson trifarius* (Loew, 1849)

Syn: *Antiphriusson sareptanus* Lichtwardt, 1903; *A. thalhammeri* Lichtwardt, 1903.

Length: 14-15 mm; Wings 9-10 mm.

General Distribution: Albania, Algeria, Armenia, Egypt, France, Greece, Hungary, Israel, Italy, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Spain, Syria, Tajikistan, Tunisia, Uzbekistan, Yugoslavia (Lehr, 1988).

Distribution in Turkey: İzmir (Giray, 1981); Erzurum (Hayat, 1993); Ankara (Durmuş, 1999); İskenderun, Muğla, Nevşehir, Hatay (Bosak and Hradsky, 2001).

Examined material: Eskişehir/Sarıcakaya T. (Mayıslar V.), 310 m, 28/06/1993, 3 ♀♀, 4 ♂♂ (Dağküplü K.) 450 m, 16/07/1993, 1 ♀, 1 ♂; 22.07.1996, 2 ♂♂ (Figures 36-39).

9. *Dysmachus fuscipennis* (Meigen, 1820)

Syn: *Asilus spiniger* (Zeller, 1840).

Length: 17-19 mm; Wings: 11-12 mm.

General Distribution: Albania, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Italy, Kazakhstan, Poland, Romania, Russia, Switzerland, Yugoslavia (Geller-Grimm, 2001b)

Distribution in Turkey: Bitlis, Bursa, Çanakkale, Diyarbakır Kütahya (Giray, 1981); Erzincan (Hayat, 1993); Ankara (Durmuş, 1999); Denizli, Giresun, Kırşehir, Mersin, Sivas, Van (Bosak and Hradsky, 2001); Bursa, Çanakkale (Çalışkan, 2002).

Examined material: Eskişehir (Çukurhisar T.), 850 m, 19/07/1993, 1 ♂, 25/07/1993, 2 ♂♂ (Figures 40-43).

10. *Dysmachus praemorsus* (Loew, 1854)

Syn: *Asilus nigripes* (Macquart, 1826); *Lophonotus tridens* (Egger, 1855); *Dysmachus foliiformis* Becker, 1923.

Length: 15-16 mm; Wings: 9-9.5 mm.

General Distribution: Albania, Austria, Bulgaria, France, Germany, Hungary, Poland, Russia, Yugoslavia (Lehr, 1988).

Distribution in Turkey: Erzincan, Erzurum, (Hayat, 1993); Ankara (Durmuş, 1999); Ağrı, Bitlis Kütahya (Bosak and Hradsky, 2001).

Examined material: Eskişehir (İnonü, Uludere V.), 870 m, 27/05/2001, 4 ♀♀, 6 ♂♂ (Figures 44-49).

11. *Epitriptus cingulatus* (Fabricius, 1781)

Syn: *Asilus maculosus* (Harris, 1776); *A. striatus* (Meigen, 1820); *A. annulatus* (Macquart, 1826); *A. pictipes* (Loew, 1848).

Length: 12-14 mm; Wings: 6,5-7,5 mm.

General Distribution: Albania, Austria, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iran, The Netherlands, Norway, Poland, Romania, Switzerland, UK (Lehr, 1988).

Distribution in Turkey: Artvin, Erzincan, Erzurum, Iğdır, Kars (Hayat, 1993)

Examined material: Eskişehir (Province), 850 m, 22/06/1993, 1♂; 800 m, 22/06/1993, 3 ♀♀, 1 ♂; 12/07/1993, 3 ♀♀, 2 ♂♂; 15/07/1993, 1 ♀, 4 ♂♂; 02/08/1993, 5 ♀♀, 8 ♂♂; 02/09/1993, 2 ♀♀, 4 ♂♂; Eskişehir (Muttalip V.); 800 m, 18/07/1993, 5 ♀♀, 3 ♂♂; 26/07/1993, 9 ♀♀, 14 ♂♂; 05/08/1993, 8 ♀♀, 11 ♂♂; 13/08/1993, 12 ♀♀, 17 ♂♂; 14/08/1993, 13 ♀♀, 15 ♂♂; 22/08/1993, 18 ♀♀, 22 ♂♂; 23/08/1993, 27 ♀♀, 33 ♂♂; 24/08/1993, 21 ♀♀, 17 ♂♂; 27/08/1993, 6 ♀♀, 11 ♂♂; 01/09/1993, 6 ♀♀, 11 ♂♂; 02/09/1993, 4 ♀♀, 7 ♂♂ (figures 50-54).

12. *Machimus annulipes* (Brullé, 1832)

Syn: *Asilus annulipes* Brullé, 1832; *Machimus basalis* Loew, 1849.

Length: 17,5-18 mm; Wings 12-13 mm.

General Distribution: Albania, Bulgaria, Crimea, Caucasian, Greece Israel, Kazakhstan, Poland, Romania, Switzerland, Yugoslavia (Lehr, 1988).

Distribution in Turkey: Aydın, İzmir (Giray, 1981); Ankara (Durmuş, 1999); Kayseri, Malatya, Nevşehir (Bosak and Hradsky, 2001); Balıkesir, Çanakkale (Çalışkan, 2002).

Examined material: Eskişehir (Musaözü V.), 850 m, 20/08/1993, 2 ♂♂ (Figures 55-58).

13. *Machimus negevensis* Theodor, 1980

Length: 18 mm, Wings: 11,5 mm.

Head: Face as wide as half of eye and with gray tomentum; yellow setae and bristles on antennal segment 1-2; white setae on each side on frons. Ocellar setae black. Occipital setae white-yellow. Antennae, black; segment 1 longer than segment 2; segment 3 as long as segment 1+2; arista about as long as half of segment 3. Palps with white setae.

Thorax: Mesonotum with a distinct dark brown median stripe; yellowish in the middle, divided two lateral areas by a yellowish stripe. Mesopleuron with a strong setae at posterior corner of dorsal side; pteropleuron with two setae at upper middle part. Legs: Black; yellowish hairs; at ventral part of fore femur with a row of yellow setae anteriorly and black setae posteriorly; fore tibia with long yellow setae laterally but on dorsal side a row of black setae posteriorly and a row of yellow setae anteriorly; fore basitarsus with long yellow setae laterally and short black ones ventrally; middle femur with a row of yellow setae ventrally and a few yellow setae at posterior; middle basitarsus with long yellow setae laterally and short black ones ventrally; hind femur with three rows of yellow setae; hind tibia with scattered yellow-black setae, ventral side of basitarsus with long laterally but short in the middle numerous black setae; hind tibia and tarsi with long strong yellow and also much short black setae; tarsi dark brown-black.

Abdomen: Terga with discal setae; setae yellowish; terga dark brown anteriorly, narrow in the middle posteriorly but laterally wide and with gray-yellow tomentum; discal setae stout. Sterna with yellow hairs and setae. Male genitalia dark brown (Figures 59-63).

General Distribution: Israel (Theodor, 1980).

Distribution in Turkey: First record from Turkey.

Examined material: Eskişehir (Mihalgazi V.), 26/05/2001, 300 m, 1 ♂; Sarıcakaya (Laçın V.), 330 m, 26.05.2001, 2 ♂♂.

14. *Machimus largus* Richter, 1963

Length: 16 mm, Wings: 9 mm.

Head: Face white. Face tubercle distinct and as high as half of head, surface of it with sparse black hairs dorsally but white ventrally and in the middle. Antennae: black; segment 1 much more longer than segment 2; segment 3 as long as segment 1+2; arista as long as 1/3 of segment 3.

Thorax: Mesonotum with a median stripe ended before scutellum; mesonotum anteriorly dark brown but some light yellowish areas; posterior part of it gray and with yellow tomentum. Legs: black and with long white

and black setae; fore femur with 2 black setae posterodorsally; fore tibia with dorsally a row of black setae but ventrally brownish dense hairs; posteriorly black long setae; middle femur with two rows of long black setae laterally; posteriorly 2-3 short black setae; hind legs with numerous black long stout setae.

Abdomen: Gray-black. Terga with discal setae; they with broad dark brown areas anteriorly and medianly, grayish brown laterally and posteriorly; terga and sterna with yellowish long hairs. Male genitalia dark brown-black (Figures 64-68).

General Distribution: Azerbaijan, Armenia, Russia (Richter, 1963).

Distribution in Turkey: First record from Turkey.

Examined material: Eskişehir (Karaşehir V.), 870 m, 14.06.2001, 1 ♂; Eskişehir (Uludere V.), 990 m, 27/05/2001, 2 ♂♂.

15. *Machimus rufostriatus* Theodor, 1980

Length: 16 mm, Wings: 10 mm.

Head: Face with white tomentum and as wide as 1/3 of eye; antennae: black; segment 1 longer than segment 2; segment 3 as long as segment 1+2 or slightly long and cylindrical; arista as long as a half of segment 3; segment 1-2 with black and white hairs. Palps with black hairs but ventrally white hairs.

Thorax: Mesonotum brown-gray and with a dark brown median band divided by a thin long gray stripe; mesonotum with short black hairs anteriorly and white hairs laterally and posteriorly. Legs: Black and dark reddish; fore and middle femur black anteroventrally but reddish posteriorly; all tibia reddish and with a black stripe extended throughout; ventral side of fore femur with long white hairs; all legs bear white hairs and also black or a few white setae; hind femora with several rows of black setae.

Abdomen: Brown-gray and with yellow tomentum. Terga with yellow discal setae; terga 1 with long strong setae laterally; anterior and posterior sides of terga naked. Sterna same as terga in colour and with long yellow hairs and strong bristle. Male genitalia reddish brown (Figures 69-72).

General Distribution: Israel (Theodor, 1980).

Distribution in Turkey: First record from Turkey.

Examined material: Eskişehir (Seyitgazi, Sandıközü V.), 1100 m, 04.08.2000, 2 ♂♂.

16. *Machimus setibarbus* (Loew, 1849)

Sin: *Asilus intermedius* (Holmgren in Zetterstedt, 1852); *Machimus setiventris* Engel, 1928.

Length: 25-27 mm; Wings 13-14 mm.

General Distribution: Bulgaria, Czech Republic, Finland, Germany, Greece, Israel, Italy, Poland, Romania, Russia, Spain, Sweden, Switzerland, Norway, Tunisia, Yugoslavia (Geller-Grimm, 2001b)

Distribution in Turkey: Denizli, İzmir (Janssens, 1968); İzmir (Giray, 1981); Artvin, Erzincan, Erzurum (Hayat, 1993); Ankara (Durmuş, 1999); Adana, Adıyaman, Antalya, Hatay, Isparta, İstanbul, Konya, Kütahya, Mersin, Muğla, Şanlıurfa, Van (Bosak and Hradsky, 2001); Balıkesir, Bursa, Çanakkale (Çalışkan, 2002).

Examined material: Eskişehir (Keskin V.), 870 m, 22/06/1993, 2 ♀♀, 5 ♂♂; (Seyitgazi T.): 10.08.1998, 1 ♀, 4 ♂♂ (Figures 73-76).

17. *Neomochtherus albicans* (Loew, 1849)

Length: 12 mm; Wings: 6 mm.

General Distribution: Tunisia, (Tsacas, 1968; Lehr, 1988).

Distribution in Turkey: Erzincan, Erzurum (Hayat, 1993); Ankara (Durmuş, 1999); Balıkesir, Çanakkale (Çalışkan, 2002).

Examined material: Eskişehir (Sarıcakaya, Dağköplü V.), 450 m, 14/08/2001, 1 ♂ (Figures 77-82).

18. *Neomochtherus mundus* (Loew, 1849)

Syn: *Neomochtherus rhodis* Tsacas, 1963.

Length: 15-16,5 mm; Wings: 10-11 mm.

General Distribution: Caucasus, Greece (Aegean Island) (Lehr, 1988).

Distribution in Turkey: Konya (Janssens, 1968); Balıkesir (Giray 1981); Erzincan, Erzurum, Iğdır (Hayat, 1993); Balıkesir (Çalışkan, 2002).

Examined material: Eskişehir (Sivrihisar, Çardaközü V.), 800 m, 15/08/1993, 5 ♂♂ (Figures 83-86).

19. *Philonicus albiceps* (Meigen, 1820)

Syn: *Asilus canescens* (Wiedemann in Meigen, 1820); *Asilus nudus* (Loew, 1840); *Asilus albibarbus* (Zeller, 1840); *Philonicus domesticus* Ricardo, 1920; *Cerdistus pulcher* (Becker, 1923); *Cerdistus marinus* (Becker, 1923); *Philonicus orientalis* Esipenko, 1969.

Length: 15-16 mm; Wings: 9,5-10 mm.

General Distribution: All Europe, Armenia, Caucasian, Iran, Iraq, Israel, Japan, Kazakhstan, Mongolia, Russia (Siberia) (Theodor, 1980; Lehr, 1988; Richter, 1988; Geller-Grimm, 2001b).

Distribution in Turkey: Erzurum (Hayat, 1993); Ankara (Durmuş, 1999); Balıkesir, Bursa, Çanakkale (Çalışkan, 2002).

Examined material: Eskişehir (Derbent V.), 890 m, 14/06/2001, 4 ♂♂ (Figures 87-91).

4. DISCUSSION

This study was done on Asilidae species collected at 1993, 1996, 1997, 2000 and 2001 from the Eskişehir province of Turkey. Being not localized on a wide area study, the determination of 19 species with the 4 new records for Turkey emphasized the importance of local studies for faunistic studies of Turkey, indicating the need for this sort of investigations.

Bosak and Hradsky (2001) reported 11 species from Sobran village of Kütahya, a neighbour province of Eskişehir, 4 of them (*L. cylindrica*, *A. trifarius*, *D. praemorsus*, *S. laevigatus*) were also reported in this study, suggesting the possibility that other species may also occur in Eskişehir region.

1st segment of the antenna of *Acanthopleura pallida* was reported to be two times longer than the 2nd segment by Theodor (1980) whereas it was observed to be slightly long in this study which was reported as a new record. This structure of the antenna is similar to *A. goedli* but the other body characteristics were the same as reported by Theodor (1980).

The length of arista of *Machimus negevensis* was reported to be in same size or slightly shorter than the 3rd antenna segment and palp were reported to be covered by black setae by Theodor (1980) but the length of arista were half of the 3rd antenna segment and palp were covered by white setae.

Machimus rufostriatus Theodor 1980 and *M. largus* Richter 1963 were not different.

Stenopogon laevigatus, *Stichopogon chrysostruma*, *Dasypogon diadema*, *Leptogaster cylindrica*, *Promachus leoninus*, *Antiphriusson adpressus*, *Machimus annulipes*, *M. setibarbus*, *Neomochtherus albicans*, *Philonicus albiceps* and *Dysmachus fuscipennis* were determined in the study area which were reported to be found at many localities of Turkey (Giray, 1981; Hayat, 1993; Durmuş, 1999; Çalışkan, 2002) suggesting the high possibility of occurrence at many uninvestigated areas of Turkey. As a final conclusion, in order to document the exact distribution of the species, further new faunistic studies are required.

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REFERENCES

- Bosak, J. and Hradsky, M. (2001). Some Remarks on the Distribution of Robber Flies (Diptera: Asilidae) in Turkey. *J. Ent. Res. Soc.* 3(3), 1-28.
- Çalışkan, H. (2002). *Güney Marmara Bölgesi Asilidae Faunasının Tespiti*. Osmangazi Üniversitesi Fen Bilimleri Enstitüsü, Eskişehir.
- Durmuş, Y. (1999). *Ankara Çevresi Asilidae (Diptera) Familyasının Faunistik ve Sistemik Yönden Araştırılması*. Gazi Üniversitesi Fen Bilimleri Enstitüsü, Ankara.
- Engel, E.O. (1930). Asilidae In Lindner, E., Die Fliegen der palaarktischen Region. 4(2), 1-491. Stuttgart.
- Geller-Grimm, F. (2001a). Information on Robber Flies, Online, <http://www.geller-grimm.de/genera04.htm>.
- Geller-Grimm, F. (2001b). Information on Robber Flies, Online, <http://www.geller-grimm.de/catalog/species.htm>.
- Giray, H. (1981). Türkiye Asilidae (Diptera) Faunasına Ait İlk Liste. *Türk. Bit. Kor. Derg.* 5(3), 171-183.
- Hasbenli, A. and Geller-Grimm, F. (1999). Two new species of *Dysmachus* Loew, 1860 (Asilidae: Diptera) from Turkey. *J. Ent. Res. Soc.* 1(1), 13-19.
- Hayat, R. (1993). *Erzurum ve Çevre İllerdeki Asilidae (Diptera) Türleri Üzerinde Faunistik ve Sistemik Çalışmalar*. Atatürk Üniversitesi Fen Bilimleri Enstitüsü, Erzurum.
- Hayat, R. and Özbek, H. (1999). The Genus *Dasypogon* Meigen, 1803 (Diptera, Asilidae) in Turkey, along with new records. *Acta Entomol. Bulg* 1, 42-47.
- Hull, F.M. (1962). *Robber Flies of the World the Genera of the Family Asilidae*. Smiths. Inst. U.S. Natn. Mus., 224(1-2), 907 pp. Washington.
- Janssens, E. (1968). Asilidae de Turquie et Region Voisines (Deuxieme Note). *Bull. Inst. R. Sci. Nat. Belg.* 44, 33.
- Lehr, P.A. (1988). Asilidae. *Catalogue of Palaearctic Diptera*. Eds.: A. Soos and L. Papp, 5, 197-326, Elsevier Science Publishing Co. Inc., Amsterdam.
- Richter, V.A. (1963). New species of robber flies (Dipt., Asilidae) from the Caucasus. *Entomological Review* [Russian: Entomologiceskoe Obozreniye]. 42(2), 43-47.
- Richter, V.A. (1988). *Asilidae Keys to the Insects of the European Part of the USSR*. Ed.: G. Ya Bei-Bienko, 5(1), 778-820, Amerind Publishing Co. Pvt., New Delhi.
- Séguy, E. (1927). *Fauna De France. 17 Dipteres (Brachyceres) Asilidae*. Federation Francaise Des Societes De Sciences Naturelles. Office Central De Faunistique.
- Theodor, O. (1980). *Diptera: Asilidae*. Fauna Palaestina. Insecta, 11, Jerusalem, pp. 1-404.
- Tsacas, L. (1968). Revision Des Espèces du Genre *Neomochtherus* Osten-Sacken, Dipteres. *Memoires Du Museum National D' Histoire Naturelle*. Serie A, Tome XLVII, Fasc. 3.
- Weinberg, M. (1987). *Dasypogon gerardi* n. sp. and the Designation of the Neotype of *Dasypogon diadema* (Fabricius, 1781) (Diptera, Asilidae). *Trav. Mus. Hist. Nat. "Grigore Antipa"*, 29, 155-164.
- Weinberg, M. and Hayat, R. (1997). Asilidae (Diptera) Recorded in Turkey. *Trav. Mus. Hist. Nat., "Grigore Antipa"*, 39, 161-168.



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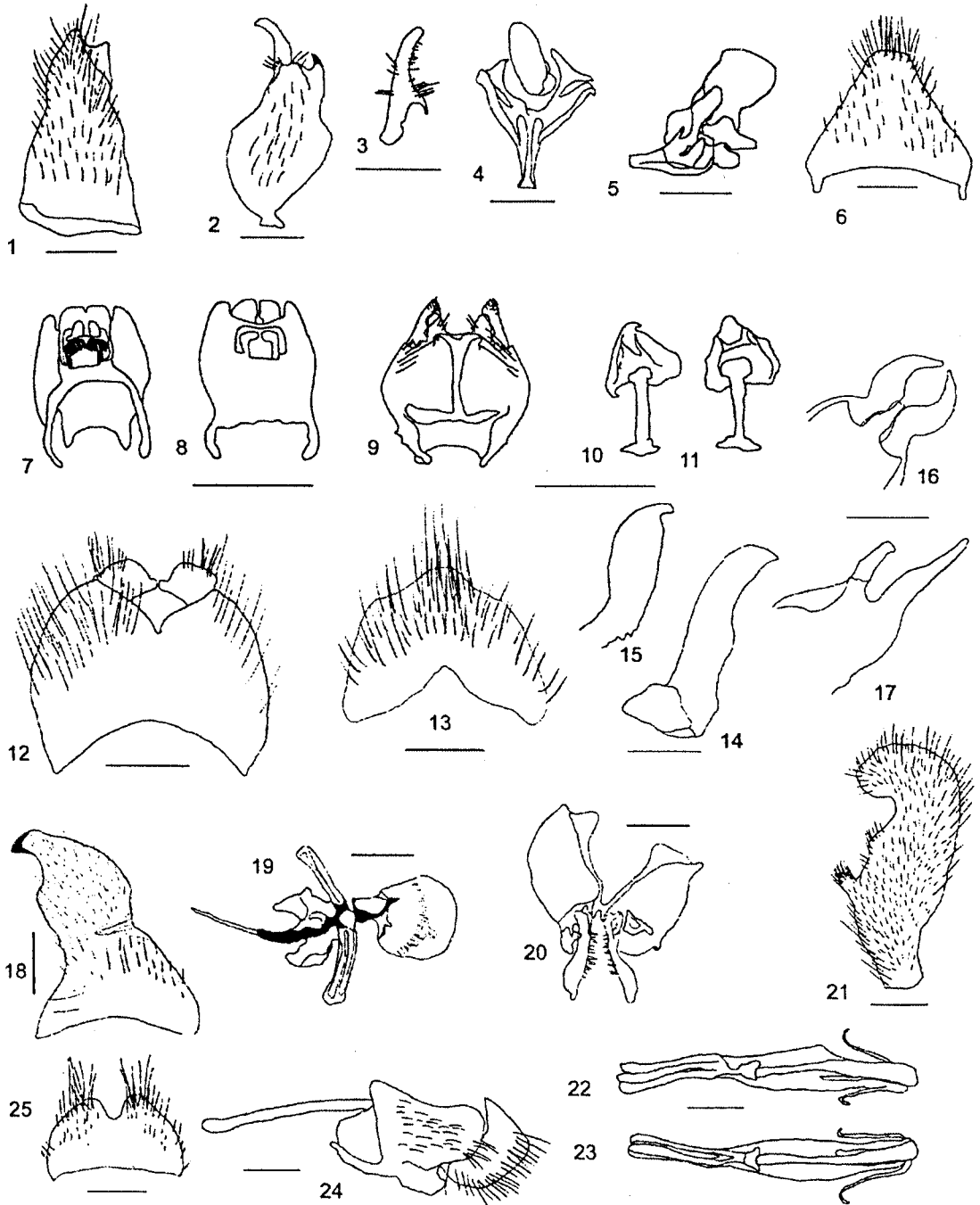


Figure 1-25: 1-6. *Stenopogon laevigatus* (Loew), 1-epandrium, 2- gonocoxite, 3- dististylus, 4- aedeagus (upper), 5- aedeagus (profile), 6- hypandrium; 7-11. *Stichopogon chrysostoma* Schiner, 7- epandrium (underside), 8- epandrium (upper), 9- gonocoxite, 10- aedeagus (profile), 11- aedeagus (upper); 12-17. *Dasypogon diadema* (Fabricius), 12- epandrium, 13- hypandrium, 14- dististylus, 15- lateral process, 16- aedeagus (upper), 17- aedeagus (profile); 18-20. *Leptogaster cylindrica* (De Geer), 18- epandrium, 19- aedeagus, 20- gonocoxite and dististylus; 21-25. *Promachus leoninus* Loew, 21- epandrium, 22- aedeagus (profile), 23- aedeagus (underside), 24- gonocoxite and dististylus, 25- hypandrium (Scala 0,5 mm).

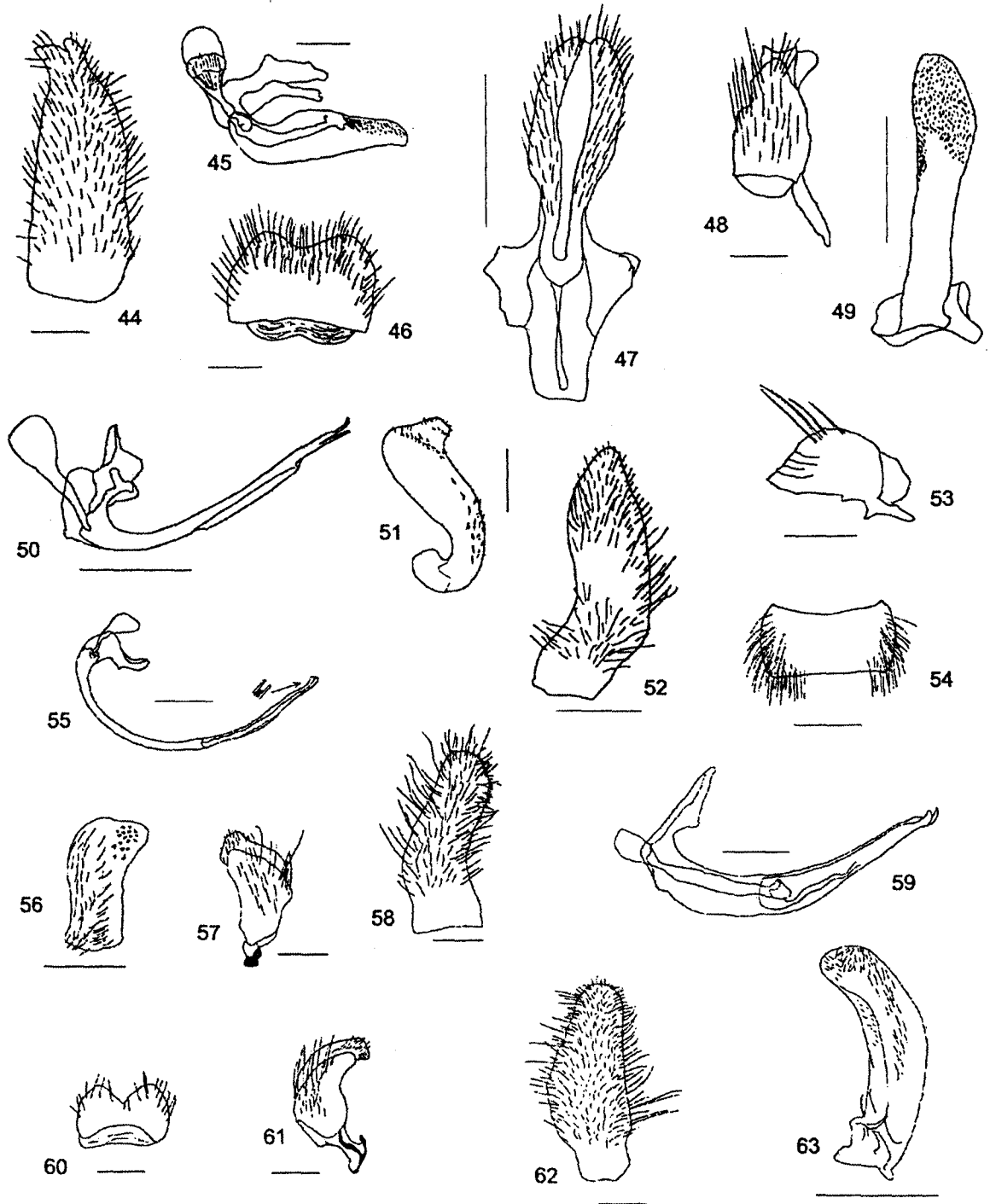


Figure 44-63: 44-49. *Dysmachus praemorsus* (Loew), 44- epandrium, 45- aedeagus, 46- hypandrium, 47- proctiger, 48- gonocoxite, 49- dististylus; 50-54. *Epitriptus cingulatus* (Fabricius), 50- aedeagus, 51- dististylus, 52- epandrium, 53- gonocoxite, 54- hypandrium; 55-58. *Machimus annulipes* (Brullé), 55- aedeagus, 56- dististylus, 57- gonocoxite and dististylus, 58- epandrium; 59-63. *Machimus negevensis* Theodor, 59- aedeagus, 60- hypandrium, 61- gonocoxite and dististylus, 62- epandrium, 63- dististylus (Scala 0,5 mm).

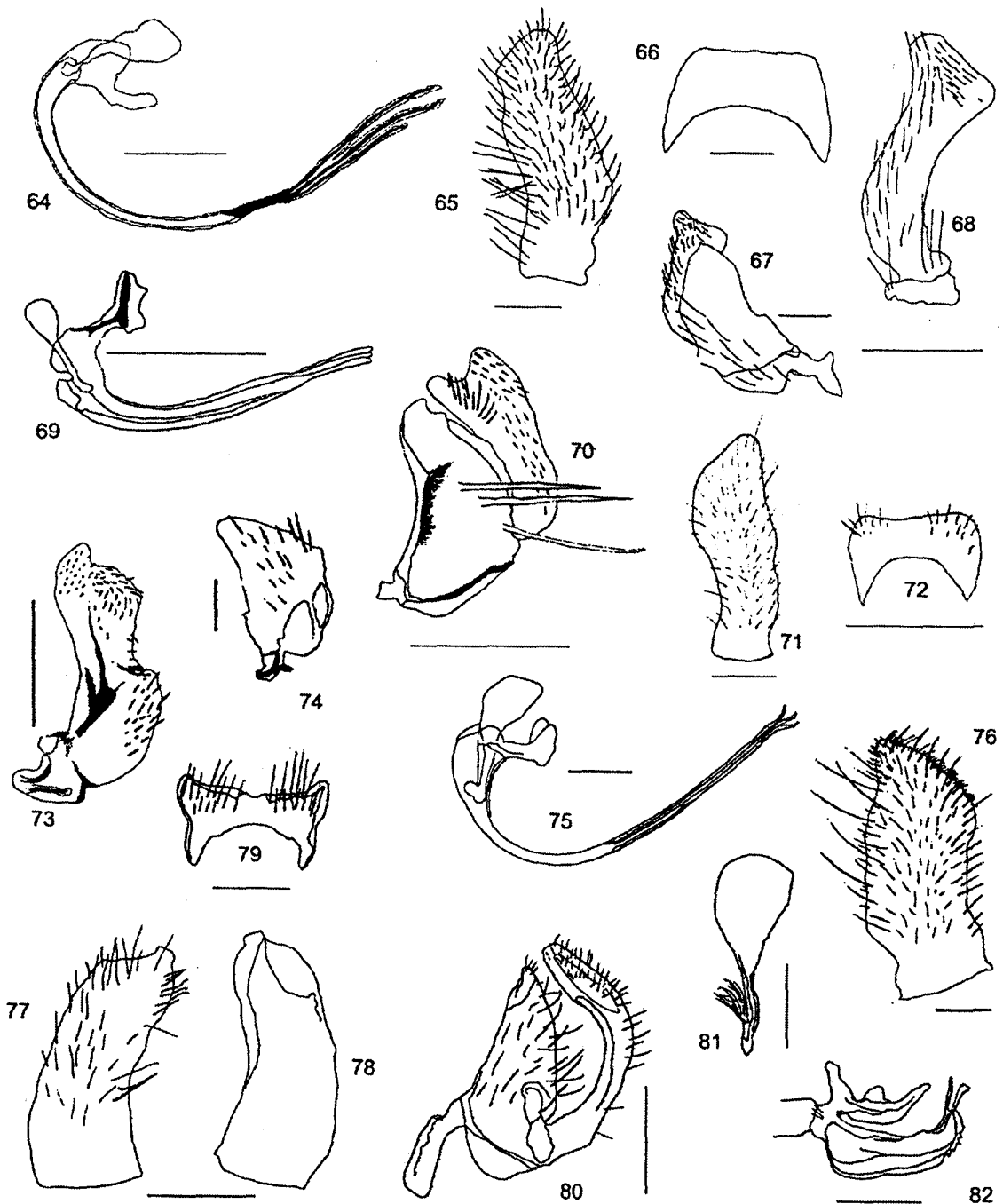


Figure 64-82: 64-68. *Machimus largus* Richter, 64- aedeagus, 65- epandrium, 66- hypandrium, 67- gonocoxite and dististylus, 68- dististylus; 69-72. *Machimus rufostriatus* Theodor, 69- aedeagus, 70- gonocoxite and dististylus, 71- epandrium, 72- hypandrium; 73-76. *Machimus setibarbus* (Loew), 73- dististylus, 74- gonocoxite, 75- aedeagus, 76- epandrium; 77-82. *Neomochtherus albicans* (Loew), 77- epandrium (upper), 78- epandrium (underside), 79- hypandrium, 80- gonocoxite and dististylus, 81- apodem, 82- aedeagus (Scala 0,5 mm).

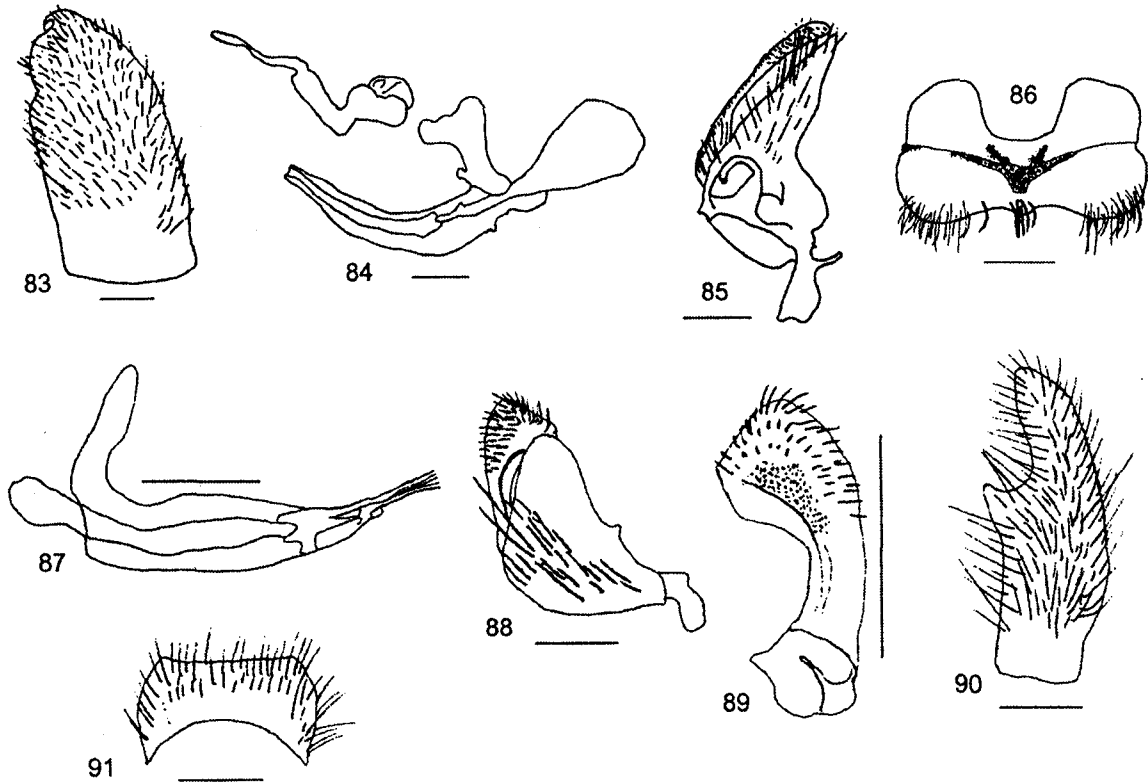


Figure 83-91: 83-86. *Neomochtherus mundus* (Loew), 83- epandrium, 84- aedeagus, 85- gonocoxite and dististylus, 86- hypandrium; 87- 91. *Philonicus albiceps* (Meigen), 87- aedeagus, 88- gonocoxite, 89- dististylus, 90- epandrium, 91- hypandrium (Scala 0,5 mm).