

Taxonomic and Faunistic Data on the Genus *Triaspis* Haliday, 1835 (Hymenoptera: Braconidae: Brachistinae) from Turkey

Tülin Koldaş, Özlem Çetin Erdoğan, Ahmet Beyarslan

Abstract—Brachistinae Förster, 1862 is a subfamily of the family Braconidae (order Hymenoptera) with about 410 species distributed all around the world. Brachistinae includes the genera, *Eubazus* Nees von Esenbeck 1814, *Foersteria Szépligeti* 1896, *Chelostes* van Achterberg 1990, *Triaspis* Haliday 1835 and *Schizoprymnus* Förster 1862. Members of the subfamily live as parasitoids on the families Curculionidae and Apionidae (Coleoptera), which also include very important agricultural pests. In generally, members of the genus *Triaspis* are poorly known biologically. The genus is represented by 37 species in the West Palearctic region and 118 species worldwide. Adult specimens of *Triaspis* were collected from as wide a range of habitats as possible at different altitudes in different parts of Turkey between 1982 and 2010. Samples collected from short plants using standard insect sweeping nets were transferred into tubes containing 70% ethanol and labelled following their preparations according to museum techniques. Seven *Triaspis* species have been reported from Turkey in this study. Five of these species are new to the fauna of Turkey.

Keywords—Braconidae, fauna, *Triaspis*, Hymenoptera, Turkey.

I. INTRODUCTION

THERE are over 410 known species of Brachistinae parasitoids. Brachistinae includes the genera, *Calyptites* Scudder, 1878, *Calyptoides* Cockerell, 1921, *Chelostes* van Achterberg 1990, *Cuniculobracon* van Achterberg & Falcó, 2001, *Dicyrtaspis van Achterberg*, 1980, *Eubazus* Nees, 1812, *Foersteria Szépligeti* 1896, *Nealiolus* Mason, 1974, *Polydegmon* Förster, 1862, *Schizoprymnus* Förster 1862, *Triaspis* Haliday 1835 [1]. The subfamily is represented by 9 genera in the West Palearctic region.

Members of Brachistinae live as parasitoids on the families Curculionidae and Apionidae (Coleoptera), which also include very important agricultural pests [2], [3].

The fauna of Turkey Brachistinae was studied rather well especially in the recent papers [3]-[8]. Although these studies have significantly contributed to the knowledge of *Triaspis* in Turkey, we still do not have adequate knowledge of the faunal composition. The aim of this study is to summarize records of the *Triaspis* spp. collected in Turkey and contribute to the

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Turkish fauna.

II. MATERIAL AND METHODS

Adult specimens of *Triaspis* were collected different locations in Turkey between 1982-2010. A sweeping-net was used for collecting specimens. They were then transferred into a hand-made aspirator and immediately killed with 70% alcohol. They were labelled following their preparations according to museum techniques. The distribution of *Triaspis* species in Turkey is mapped according to provinces (Figs. 1-7). The materials are deposited in the Zoological Museum of Department of Biology, Trakya University (TUZM).

III. RESULTS AND DISCUSSION

Seven species of *Triaspis* were identified. Five of these species are new to the fauna of Turkey: *Triaspis armeniaca* Tobias, 1976, *Triaspis pallipes* (Nees, 1816), *Triaspis sulcata* (Szépligeti, 1901), *Triaspis thoracica* (Curtis, 1860), *Triaspis xylophagi* Fischer, 1966

A. *Triaspis armeniaca* Tobias, 1976

Triaspis armeniaca Tobias, 1976 Opređ. Faune SSSR. Nauka Press. Leningrad. 110. 286 pp.

Material Examined: SAMSUN-Salıpazarı-Derbentaltı, 41° 10'10"N, 36°10'20"E, (970 m): 03.07.2003, 1♀; Salıpazarı-Kayaköprü, 41°10'18"N, 36°28'16"E, (100 m): 03.07.2003, 1♀.

General Distribution: Armenia.

New record for Turkey.

B. *Triaspis caudata* (Nees, 1816)

Sigalphus caudatus Nees, 1816 Magazin Gesellschaft Naturforschender Freunde zu Berlin. 7(1813):243-277.

Sigalphus australis Szépligeti, 1901 Termesztud. Közl.: Állattani Közlem. 33: 174-184, 261-288.

Sigalphus gracilis Herrich-Schäffer, 1838 Regensburg. Heft 153.

Triaspis arcticus Hellén, 1958 Fauna Fennica. 4:3-37.

Material Examined: ANKARA-Ayaş-Başbereket, 40°05'36"N, 32°23'39"E, (1058 m): 08.06.2007, 1♀; AMASYA-Merzifon-Tavşan dağı-Esenköy yaylası, 41°00'37"N, 35°17'23"E, (1700 m): 27.08.2004, 2♀♀, 1♂; BAYBURT-Çerçi, 40° 21'34"N, 39°51'40"E, (1760 m): 30.08.2004, 1♂; BİLECİK-Ayvacık, 40°10'19"N, 29°51'15"E, (700 m): 09.07.1993, 2♂♂; DÜZCE-Kaynaşlı-Üçköprü, 40°48'03"N, 31°14'15"E, (200 m): 27.06.2001, 1♂; EDİRNE-Hadımağa, 41°40'55"N, 26°33'44"E, (41 m): 23.05.1987, 3♀♀; 24.05.1987, 2♀♀; 23.05.1991, 1♀.

3♂♂; 03.06.1992, 1♀, 2♂♂; Havsa-Oğulpaşa, 41°34'60N, 26°45'00E, (50 m): 06.06.1992, 20♂♂; Keşan-Koru dağı, 40°51'21N, 26°37'49E, (300 m): 12.06.1991, 1♂; Lalapaşa-Bağlık deresi, 41°49'60N, 26°43'60E, (500 m): 05.06.1988, 1♂; Lalapaşa-Doğanköy, 41°55'34N, 26°42'03E, (370 m): 06.06.1987, 3♂♂; 04.06.1992, 1♂; Lalapaşa-Hamzabeyli, 41°57'50N, 26°38'34E, (72 m): 26.05.1992, 2♂♂; Süleoğlu, 41°46'10N, 26°54'31E, (80 m): 07.06.1987, 3♀♀; 29.06.1993, 6♀♀, 2♂♂; Süleoğlu-Süleoğlu Barajı, 41°48'33N, 26°55'26E, (80 m): 07.06.1987, 9♀♀, 1♂; 28.05.1988, 1♀; Tavuk Ormanı, 41°46'39N, 26°28'51E, (41 m): 22.05.1993, 1♂; Trakya Üniversitesi-Balkan Yerleşkesi, 41°40'28N, 26°33'39E, (41 m): 06.04.2001, 1♂; **GİRESUN**-Alucra, 40°17'56N, 38°48'03E, (1550 m): 02.07.2004, 1♂; **GÜMÜŞHANE**-Kelkit-Gürüzdağı, 40°15'57N, 39°28'58E, (1871 m): 02.07.2004, 3♂♂; **İÇEL**-Erdemli-Sandal Dağı, 36°36'24N, 34°08'35E, (400 m): 22.05.1984, 1♀, 3♂♂; **KARABÜK**-Safranbolu-İnceçay-Sarıçiçek dağı, 41°15'03N, 32°41'39E, (1000 m): 30.06.2001, 1♀, 11♂♂; **KAYSERİ**-Bünyan-Ekrek, 38°39'42N, 36°03'30E, (1424 m): 12.07.2007, 1♀; **KIRKLARELİ**-Vize-Kıyıköy, 41°38'01N, 28°05'40E, (15 m): 08.05.1988, 1♀; Vize-Pabuçdere, 41°34'21N, 27°45'57E, (130 m): 07.05.1988, 1♂; 08.05.1988, 1♀, 2♂♂; **KASTAMONU**-Daday-İnceğiz, 41°28'60N, 33°32'60E, (850

m): 01.07.2001, 1♂; Ilgaz dağı, 41°10'60N, 33°50'21E, (2100 m): 30.08.2002, 1♂; **KIRŞEHİR**-Mucur-Kurugöl, 39°01'54N, 34°26'41E, (1046 m): 07.06.2007, 2♂♂; **ORDU**-Gölköy, 40°42'36N, 37°37'21E, (1015 m): 06.07.2004, 1♂; **SİNOP**-Ayancık-Çangal dağı-Kozcağız, 41°43'58N, 34°45'50E, (1000 m): 02.07.2001, 1♀; Boyabat-Salar, 41°31'60N, 34°40'60E, (450 m): 03.07.2001, 1♀; **SİVAS**-Yıldızeli-Ekecik, 39°48'34N, 36°08'23E, (1152 m): 30.05.2007, 5♂♂; Zara-Bulakbaşı, 39°52'46N, 37°33'31E, (1297 m): 31.05.2007, 1♂; **TOKAT**-Erbaa, 40°40'09N, 36°38'06E, (234 m): 28.08.2004, 1♀; Taşlıçiftlik, 40°18'50N, 36°33'16E, (550 m): 06.07.2003, 1♂; Turhal-Doğanlı çiftliği, 40°18'14N, 36°19'29E, (554 m): 30.06.2004, 1♀; Turhal-Kalaycık, 40°36'28N, 36°10'20E, (570 m): 03.09.2003, 1♂; **YOZGAT**-Sorgun-Mahmatlı, 39°42'05N, 35°21'50E, (1083 m): 30.05.2007, 1♀.

General Distribution: Armenia; Azerbaijan; Belgium; Bosnia Hercegovina; Bulgaria; Croatia; Former Czechoslovakia; Denmark; Finland; Former Yugoslavia; France; Germany; Greece; Hungary; Ireland; Italy; Kazakhstan; Latvia; Lithuania; Moldova; Netherlands; Poland; Russia; Spain; Spain-main; Sweden; Switzerland; United Kingdom.

Distribution in Turkey: Adana-Balcalı, Burdur-Merkez, İçel-Silifke-Göyceburun [9].

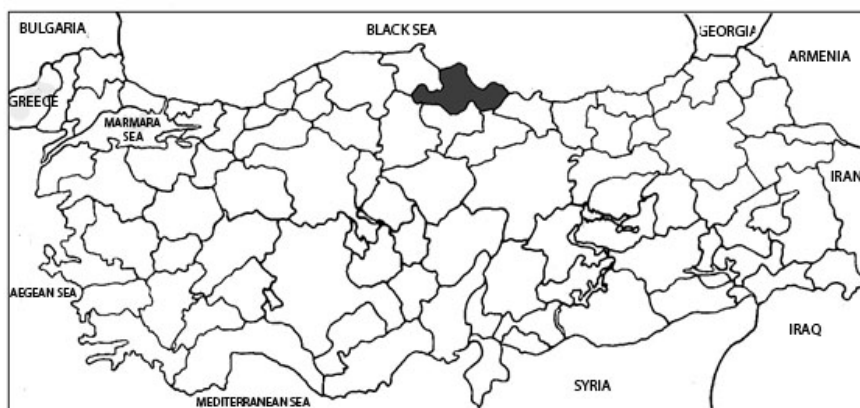


Fig. 1 Distribution of *Triaspis armeniaca* in Turkey

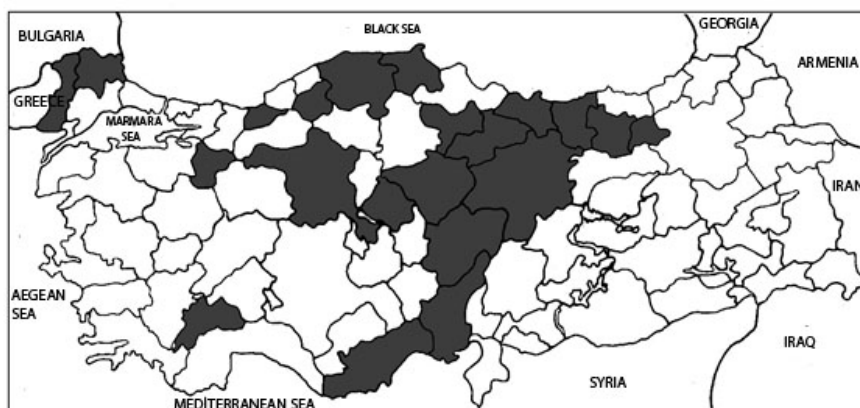


Fig. 2 Distribution of *Triaspis caudata* in Turkey

C. Triaspis obscurella (Nees, 1816)

Sigalphus obscurellus Nees, 1816 Magazin Gesellschaft Naturforschender Freunde zu Berlin. 7(1813):243-277.

Sigalphus aciculatus Ratzeburg, 1848 Berlin. 238 pp.

Sigalphus flavipalpis Wesmael, 1835 Nouveaux Mémoires de l'Academie Royale des Sciences et Belles-lettres Bruxelles. 9:1-252.

Sigalphus floricola Wesmael, 1835 Nouveaux Mémoires de l'Academie Royale des Sciences et Belles-lettres Bruxelles. 9:1-252.

Sigalphus similis Szépligeti, 1901 Termeszeti Tud. Közl.: Állattani Közlem. 33: 174-184, 261-288.

Sigalphus simulator Szépligeti, 1901 Termeszeti Tud. Közl.: Állattani Közlem. 33: 174-184, 261-288.

Material Examined: **AFYON**-İhsaniye-Yeniceköy, 38°58'23N, 30°17'21E, (950 m): 26.07.1997, 1♀; **AKSARAY**-İhlara-Yaprakhisarı, 38°13'18N, 34°17'14E, (1354 m): 11.09.2006, 1♀, 1♂; **BARTIN**-Amasra-Kalaycı, 41°47'03N, 32°31'47E, (15 m): 27.05.2007, 1♀; Amasra-Kurucaşile, 41°50'35N, 32°42'49E, (129 m): 27.05.2007, 3♀♀; Kurucaşile-Danişment, 41°49'37N, 32°41'23E, (126 m): 27.05.2007, 4♀♀; **ÇANAKKALE**-Eceabat-Anzak Anıtı, 40°14'19N, 26°16'37E, (10 m): 06.05.1993, 1♀; Eceabat-Tuzgözü, 41°11'03N, 26°20'18E, (10 m): 08.06.2001, 1♀; Lapseki, 40°20'39N, 26°41'08E, (40 m): 06.05.1993, 1♀, 4♂♂; **ÇORUM**-Kuşsaray, 40°35'44N, 35°08'36E, (1015 m): 29.06.2004, 1♀; **EDİRNE**-

Karaağaç, 41°39'20N, 26°31'30E, (41 m): 23.10.2010, 1♀, 1♂; Trakya Üniversitesi-Balkan Yerleşkesi, 41°40'28N, 26°33'39E, (41 m): 06.04.2001, 3♂♂; 20.04.2001, 2♀♀, 1♂; **GÜMÜŞHANE**-Kelkit-Yeniköy, 40°19'26N, 39°29'33E, (1474 m): 29.08.2004, 1♀; **KIRKLARELİ**-İğneada, 41°52'28N, 27°59'02E, (20 m): 17.06.1987, 1♀; Vize-Pabuçdere, 41°34'21N, 27°45'57E, (130 m): 07.05.1988, 1♀; **KAYSERİ**-Bağpınar, 38°49'12N, 35°37'56E, (1097 m): 14.09.2006, 2♀♀, 2♂♂; **KONYA**-Akşehir-Doğrugöz, 38°21'12N, 31°28'42E, (996 m): 08.09.2006, 6♂♂; Beysşehir-Çukurağıl, 37°53'21N, 31°54'20E, (1228 m): 09.09.2006, 1♀; Seydişehir, 37°28'20N, 31°49'30E, (1130 m): 09.09.2006, 1♀, 1♂; **MANİSA**-Güzel-Zincirlikuyu (70 m): 03.05.1997, 2♀♀, 1♂; **NİĞDE**-Çiftlik, 38°10'14N, 34°29'17E, (1562 m): 18.07.2007, 2♀♀; **TEKİRDAĞ**-Malkara, 40°53'43N, 26°54'34E, (100 m): 23.05.1992, 1♀; **ZONGULDAK**-Devrek-Davulga, 41°10'20N, 31°38'20E, (800 m): 29.06.2001, 1♀.

General Distribution: Azerbaijan; Bulgaria; Canary Islands; Croatia; Czech Republic; Czechoslovakia; France; Germany; Greece; Greece-Crete; Former Yugoslavia; Hungary; Iran; Israel; Italy; Kazakhstan; Lithuania; Macedonia; Moldova; Mongolia; Netherlands; Poland; Russia; Russia-Kaliningrad Oblast; Russia-Yakutskaya Respublika; Slovakia; Spain; Switzerland; Ukraine; United Kingdom; Uzbekistan.

Distribution in Turkey: Erzurum-Atatürk Üniversitesi Kampüs, Kars-Sarıkamış-Karakurt-Aras Vadisi [8].

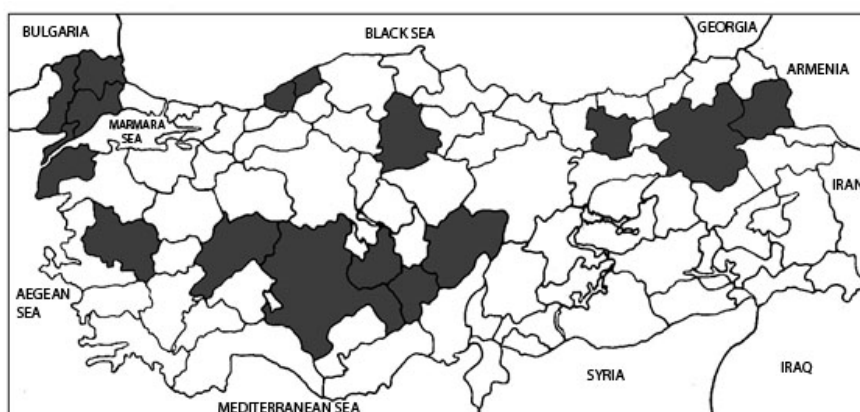


Fig. 3 Distribution of *Triaspis obscurella* in Turkey

D. Triaspis pallipes (Nees, 1816)

Sigalphus pallipes Nees, 1816 Magazin Gesellschaft Naturforschender Freunde zu Berlin. 7(1813):243-277.

Brachistes fagi Ratzeburg, 1852 Berlin. 272 pp.

Helcon fulvipes Haliday, 1835 Entomological Magazine. 3(2):121-147.

Leiophron fulvipes Curtis, 1833 10:464, 476.

Sigalphus breviventris Thomson, 1892 Opuscula Entomologica. 16:1659-1751.

Sigalphus flavipalpis Wesmael, 1835 Nouveaux Mémoires de l'Academie Royale des Sciences et Belles-lettres Bruxelles. 9:1-252.

Sigalphus similis Szépligeti, 1901 Termeszeti Tud. Közl.:

Állattani Közlem. 33: 174-184, 261-288.

Material Examined: **ADAPAZARI**-Hendek-Hüseyinşeyh, 40°48'28N, 30°47'06E, (220 m): 27.06.2001, 1♀; **AMASYA**-Merzifon-Tavşan dağı-Esenköy yaylası, 41°00'37N, 35°17'23E, (1700 m): 09.07.2003, 1♀, 4♂♂; 27.08.2004, 1♀; Merzifon-Tavşan dağı-Uzunağaç, 40°51'26N, 35°18'15E, (1600 m): 09.07.2003, 6♀♀, 11♂♂; **SİNOP**-Kabalı, 41°52'00N, 34°04'60E, (70 m): 11.06.2002, 1♀, 1♂; **TOKAT**-Almus-Gümelönü-Tomara Deresi, 40°17'60N, 37°07'60E, (800 m): 02.09.2003, 1♀.

General Distribution: Azerbaijan; Bulgaria; Canary Islands; China; Czech Republic; France; Germany; Hungary; Ireland; Italy; Kazakhstan; Latvia; Moldova; Norway; Poland; Russia; Switzerland; Ukraine; United Kingdom.

New record for Turkey.

E. Triaspis sulcata (Szépligeti, 1901)

Sigalphus sulcatus Szépligeti, 1901 Termeszettud. Közl.: Állattani Közlem. 33: 174-184, 261-288.

Sigalphus rufipes Szépligeti, 1898 Természettud. Közl.: 21:381-396 (Hungarian), 396-408 (German).

Material Examined: **BALIKESİR**-Bandırma-Kuşçenneti Milli Parkı, 40°13'05N, 28°00'40E, (15 m): 10.05.1991, 1♂; **BURSA**-İnegöl-Mezit-Nebiyatağı, (1450 m): 11.07.1993, 1♂; **ÇANAKKALE**-Gökçeada-Uğurlu, 40°07'27N, 25°42'25E, 05.06.1996, 1♀; **EDİRNE**-Keşan-Sazlıdere, 41°36'00N, 26°40'

60E, (65 m): 31.05.1999, 1♂; **İSTANBUL**-Sarıyer-Bahçeköy-Bilezikçi Çiftliği, 41°10'00N, 29°03'00E, (35m): 24.06.1993, 1♀; **KIRKLARELİ**-Demirköy-Boztaş, 1°55'00N, 27°37'60E, (350 m): 06.07.1997, 1♂; Dereköy, 41°55'58N, 27°22'00E, (500 m): 28.06.2002, 1♂; **SİNOP**-Kabalı, 41°52'00N, 34°04'60E, (70 m): 11.06.2002, 1♀; **TEKİRDAĞ**-Muratlı-Hanoğlu, 41°12'00N, 27°21'00E, (87 m): 09.06.2001, 1♀; Saray, 41°27'08N, 27°55'33E, (150 m): 16.06.2001, 1♂.

General Distribution: Greece, Hungary, Italy.

New record for Turkey.

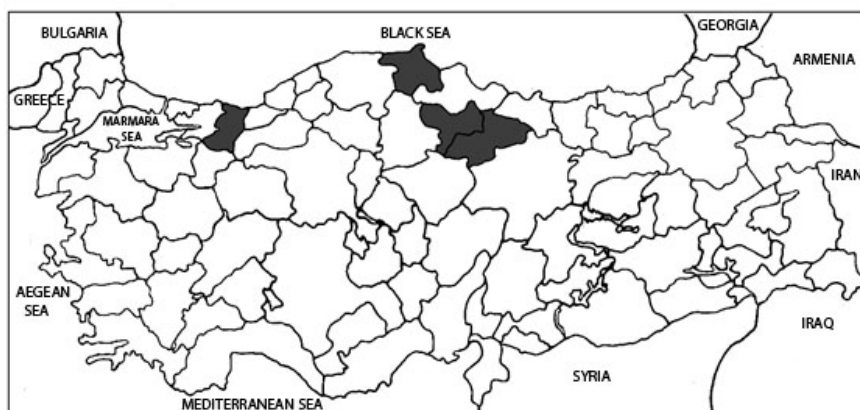


Fig. 4 Distribution of *Triaspis pallipes* in Turkey

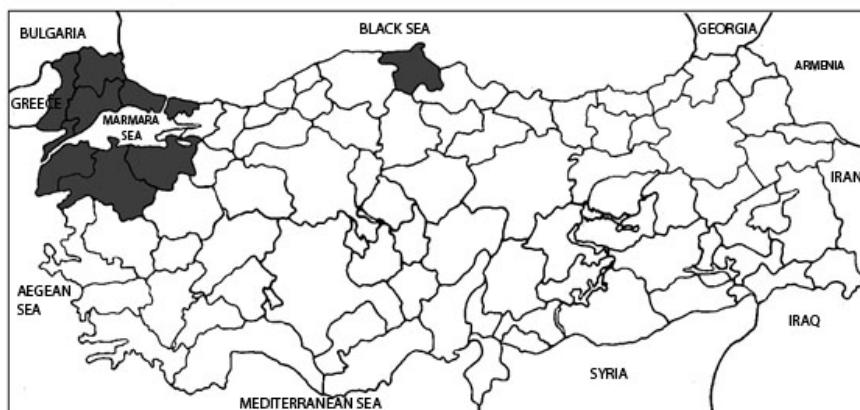


Fig. 5 Distribution of *Triaspis sulcata* in Turkey

F. Triaspis thoracica (Curtis, 1860)

Sigalphus thoracicus Curtis, 1860 John van Voorst, London. 528 pp.

Sigalphus brucivorus Rondani, 1877 Bollettino della Societa Entomologica Italiana. 9:166-206.

Sigalphus collaris Thomson, 1874 Opuscula Entomologica. Lund. 6:553-588.

Sigalphus gibberosus Szépligeti, 1901 Termeszettud. Közl.: Állattani Közlem. 33: 174-184, 261-288.

Sigalphus primus Brèthes, 1925 Revista de la Facultad de Agronomia. Buenos Aires. 16(?):57-63.

Sigalphus rugosus Szépligeti, 1901 Termeszettud. Közl.:

Állattani Közlem. 33: 174-184, 261-288.

Material Examined: **AFYON**-Evciler-Körkuyu, 38°00'11N, 30°00'16E, (950 m): 28.06.1998, 1♀; **BALIKESİR**-Bandırma-Kuşçenneti Milli Parkı, 40°13'05N, 28°00'40E, (15 m): 15.07.1993, 1♀; Manyas-Kayacaköy, 40°04'20N, 27°57'52E, (100 m): 15.07.1993, 1♂; **ÇANAKKALE**-Biga, 40°13'21N, 27°14'34E, (50 m): 16.07.1993, 1♀; Gökçeada-Uğurlu, 40°07'27N, 25°42'25E, (10 m): 07.07.1996, 1♀, 2♂♂; **DENİZLİ**-Kale-Uluçam, 30.07.1997, 1♀, 1♂; **EDİRNE**-Suakacağı, 41°50'30N, 26°35'11E, (210 m): 05.07.1997, 1♀; **GÜMÜŞHANE**-Arzular, 40°23'49N, 39°39'14E, (1304 m): 07.08.2005, 1♀; **HATAY**-Antakya, 10.06.1997, 2♂♂; 04.08.

1997, 1♀; 09.08.1997, 1♀; **KONYA**-Ilgın-Şeker Fabrikası, 38°17'46N, 31°59'43E, (1019 m): 08.09.2006, 1♀; **TEKİRDAĞ**-Işıklar-Yıldandere, (500 m): 07.08.1991, 1♂.

General Distribution: Argentina, Austria, Azerbaijan, Bulgaria, Croatia, Cyprus, Former Czechoslovakia, Former Yugoslavia, France, Georgia, Greece, Israel, Italy, Hungary, Moldova, Portugal, Romania, Russia, Tunisia, Spain, Switzerland, Ukraine, United Kingdom, Uruguay.

New record for Turkey.

G. Triaspis xylophagi Fischer, 1966

Triaspis xylophagi Fischer, 1966 Entomophaga. 11(4):341-346.

Material Examined: **TEKİRDAĞ**-Malkara, 40°53'43N, 26°54'34E, (100m): 23.05.1992, 1♀.

General Distribution: Algeria

New record for Turkey.



Fig. 6 Distribution of *Triaspis thoracica* in Turkey



Fig. 7 Distribution of *Triaspis xylophagi* in Turkey

ACKNOWLEDGMENT

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- Xiphozelinae, 17. Homolobinae, 18. Charmontinae, 19. Orgilinae, 20. Ecnomiinae, 21. Sigalphinae, 23. Ichneutinae, 25. Cardiochilinae, 27. Dirrhopinae, 28. Miracinae, 29. Adeliinae. In: Ler, P.A. 'Key to the insects of Russian Far East. Vol. 4. Neuropteroidea, Mecoptera, Hymenoptera. Pt 3.' Dal'nauka, Vladivostok., 1998, 706 pp. pp.41-162, 163-298, 411-520, 531-558.
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