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Euphorinae (Hymenoptera: Braconidae) fauna from the Thrace Region of Turkey

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Abstract: Samples were collected from the Thrace Region of Turkey between 1985 and 2003. A total of 19 species belonging to 8 genera of Euphorinae were determined. Seventeen species are new records for the Turkish Euphorinae fauna. These species are *Allurus lituratus* (HALIDAY), *A. muricatus* (HALIDAY), *Aridelus egregius* (SCHMIEDEKNECHT), *Centistes (Centistes) cuspidatus* (HALIDAY), *C. (C.) fuscipes* (NEES), *Leiophron (Euphorus) pallidistigma* CURTIS, *Peristenus digoneutis* LOAN, *P. facialis* (THOMSON), *P. grandiceps* (THOMSON), *P. nitidus* (CURTIS), *P. pallipes* (CURTIS), *P. picipes* (CURTIS), *P. rubricollis* (THOMSON), *Perilitus (Microctonus) aethiops* NEES, *P. (M.) parvicornis* (RUTHE), *P. (M.) stelleri* (LOAN), *Wesmaelia petiolata* (WOLLASTON). The general distribution and known hosts of the taxa are added. This research is the first faunistic study on Euphorinae (Hymenoptera: Braconidae) fauna of Turkey.

Key words: Euphorinae, Hymenoptera, Braconidae, Thrace Region, Turkey.

Introduction

Euphorinae is a braconid subfamily containing about 1103 species. The group is characterized by great diversity in host association matched by a similarly great morphological diversity. In fact, most braconid subfamilies are adapted to parasitism of a single host order, whereas euphorines are associated with several: they have been recorded on Orthoptera, Hemiptera, Psocoptera, Neuroptera, Coleoptera, Lepidoptera and Hymenoptera. Adaptation to parasitism of adult insects, which is rather uncommon within hymenopteran parasitoids, is widely found within the euphorines (SHAW 1985, 1988; YU et al. 2005). Complexity of Euphorinae taxonomy is well expressed by the variable number of recognized tribes in most recent studies: YU et al. (2005) recognises 14 tribes (Centistini, Cosmophorini, Cryptoxilonini, Dinocampini, Euphorini, Helorimorphini, Meteorini, Myiocephalini, Neoneurini, Oncometeorini, Perilitini, Proclithrophorini, Syntretini, Tainitermini).

Geographically, Turkey forms a natural bridge between the old world continents of Asia, Africa and Europe. The Anatolian peninsula is the western most point of Asia, divided from Europe by the Bosphorus and Dardanelles straits. Thrace is the western part of Turkey on the European continent. Turkish Thrace, extends over 23,485 km² with deciduous and coniferous forests covering 20 % of the region. These forests are mainly situated on the Ganos and Koru Mountains in the South and on the Istranca Mountains in

the northern part of the region. The rest of the study area is meadows (20 %) and cultivated land (60 %).

The present study, aiming to aid in the identification and understanding of the Turkish Euphorinae, investigated the fauna of the Turkish Thrace region in the northwest of the country.

Although some studies have been conducted by various local and foreign scientists on the species of Euphorinae occurring in Turkey, in Turkish fauna of this subfamily not well-known. Only 24 species of Euphorinae are recorded from Turkey (BEYARSLAN et al. 2004; DREA et al. 1973; FAHRINGER 1922; HUDDLESTON 1980; STEINER 1936).

Material and Methods

Between 1985 and 2003, adult specimens of Euphorinae from different habitats and altitudes of Thrace Region were collected from grass-type plants using traps. Collected samples were then pinned and labeled according to taxonomic rules and regulations. The specimens are deposited in the collection of the Zoological Museum of Department of Biology, Trakya University.

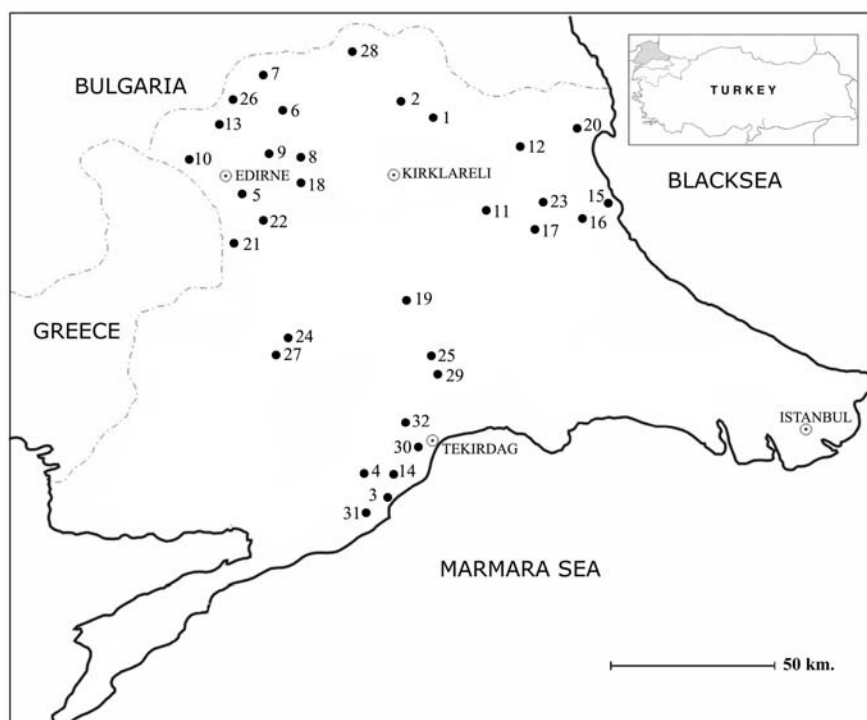


Fig. 1: Location of study sites in the Turkish Thrace region.

Relevant literature was used for taxonomical examination of materials. References are used for known distributions and hosts of the species in the world BELOKOBYSKIJ

(1992), PAPP & CHOU (1995), ROBERT et al. (1998), SHAW (1988), YU et al. (2005). The specimens were identified mostly using the keys SHAW (1985), SIMBOLOTTI et al. (2002) and TOBIAS et al. (1986).

The distribution Euphorinae species is classified according to main chorotypes of the Holarctic Region in Turkey following the terminology developed by TAGLIANTI et. al. 1999, and we are used the following zoogeographical chorotypes for Euphorinae distribution: Palaearctic chorotype, Asiatic-European chorotype, Sibero-European chorotype, European chorotype.

The study was carried out in 32 localities in Thrace Region of Turkey (Fig. 1).

Results

Nineteen species of the subfamily Euphorinae were found to occur in Thrace Region during this study. Accordingly, the number of Euphorinae species in Turkey has increased from 24 to 41.

Tribe Centistini CAPEK 1970

Allurus FORSTER 1862

Allurus lituratus (HALIDAY 1835)

Material examined: Edirne-Suakacağı (h: 210 m), 26.v.1993, 1 ♀.

General Distribution: Palaearctic: Belgium, Bulgaria, Canary Islands, Finland, France, Georgia, Germany, Greece, Ireland, Kazakhstan, Lithuania, Poland, Sweden, United Kingdom. Nearctic.

Hosts: Parasitoid of Coleoptera: *Sitona crinita*, *S. inops*, *S. lepidus*, *S. lineata*, *S. scissifrons* (Curculionidae).

New record for Turkey.

Allurus muricatus (HALIDAY 1833)

Material examined: Edirne-Havsa-Abalar (h: 45 m), 01.viii.1992, 1 ♀ ♣ Kırklareli-Erenler (h: 290 m), 16.vi.1987, 13 ♀ ♀; 1 ♂; Kofçaz (h: 300 m), 18.vi.1986, 1 ♀.

General Distribution: Palaearctic: Armenia, Azerbaijan, Belgium, Bulgaria, Croatia, Czechoslovakia, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Moldova, Poland, Spain, Sweden, Switzerland, United Kingdom, Yugoslavia.

Hosts: Parasitoid of Coleoptera and Lepidoptera: *Sitona hispidula*, *S. humeralis*, *S. lineata*, *S. regensteiniensis*, *S. sulcifrons* (Curculionidae); *Stigmella aceris*, *S. obliquella*, *S. torminalis* (Nepticulidae).

New record for Turkey.

Centistes HALIDAY 1835***Centistes (Centistes) cuspidatus* (HALIDAY 1833)**

M a t e r i a l e x a m i n e d : Kırklareli-Dereköy (h: 500 m), 25.iv.1985, 1♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Poland, Russia, Slovenia, Sweden, Switzerland, Ukraine, United Kingdom, Yugoslavia.

H o s t s : Parasitoid of Coleoptera and Diptera: *Asphondylia conglomerata* (Cecidomyiidae); *Leperisinus varius* (Curculionidae); *Tachyporus chrysomelinus*, *T. hypnorum*, *T. obtusus*, *T. solutus* (Staphylinidae).

New record for Turkey.

***Centistes (Centistes) fuscipes* (NEES 1834)**

M a t e r i a l e x a m i n e d : Edirne-yolüstü (h: 50 m), 20.vi.1987, 1♂; Tekirdağ-Bıyıklı (h: 110 m), 26.vi.2003, 1♂.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Azerbaijan, Belgium, Bulgaria, Canary Islands, Czechoslovakia, Finland, France, Georgia, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Moldova, Poland, Russia, Slovakia, Sweden, Switzerland, United Kingdom.

H o s t : Parasitoid of Lepidoptera: *Elachista trapeziella* (Elachistidae).

New record for Turkey.

Tribe D i n o c a m p i n i SHAW 1985***Dinocampus* FORSTER 1862*****Dinocampus coccinellae* (SCHRANK 1802)**

M a t e r i a l e x a m i n e d : Edirne-Lalapaşa-Kalkansöğüt (h: 200 m), 05.vii.1997, 1♀; Kırklareli-Lüleburgaz-Türkgeldi farm (h: 60 m), 18.viii.1991, 1♀; Tekirdağ-Şarköy-Güzelköy (h: 150 m), 25.vi.2003, 1♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Albania, Algeria, Austria, Azerbaijan, Belgium, Bulgaria, China, Cyprus, Czech Republic, Czechoslovakia, Egypt, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Moldova, Netherlands, Norway, Poland, Russia, Slovakia, Switzerland, Syria, Turkey, United Kingdom, Yugoslavia.

H o s t s : Parasitoid of Coleoptera: *Adalia bipunctata*, *A. decempunctata*, *A. deficiens*, *Anatis labiculata*, *A. ocellata*, *Brachiacantha ursina*, *Calvia quatuordecimguttata*, *Coccinella arcuata*, *C. californica*, *C. divaricata*, *C. hieroglyphica*, *C. magnifica*, *C. novemnotata*, *C. octodecimguttata*, *C. quatuordecimpustulata*, *C. quinquepunctata*, *C. repanda*, *C. septempunctata*, *C. transversalis*, *C. transversoguttata*, *C. trifasciata*, *C. undecimpunctata*, *Coelophora biplagiata*, *C. inaequalis*, *Coleomegilla maculata*, *Cycloneda munda*, *C. sanguinea*, *Halyzia quatuordecimguttata*, *Harmonia axyridis*, *H.*

conglobata, *H.dimidiata*, *H.octomaculata*, *H.quadripunctata*, *Hippodamia convergens*, *H. glacialis*, *H. parenthesis*, *H. quinquesignata*, *H. sinuata*, *H. tredecimpunctata*, *H. undecimnotata*, *H.variegata*, *Illeis cincta*, *Macronaemia hauseri*, *Menochilus sexmaculatus*, *Micraspis discolor*, *Myzia oblongoguttata*, *Propylaea quatuordecimpunctata*, *Subcoccinella vigintiduopunctata*, *Tytthaspis sedecimpunctata* (Coccinellidae); *Sitona discoideus* (Curculionidae).

Tribe E u p h o r i n i FORSTER 1862

Leiophron NEES 1819

Leiophron (Euphorus) pallidistigma CURTIS 1833

M a t e r i a l e x a m i n e d : Kırklareli-Yeniceköy (h: 660 m), 16.vi.1987, 1♂.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Azerbaijan, Belgium, Finland, France, Germany, Hungary, Ireland, Italy, Korea, Moldova, Netherlands, Poland, Russia, Sweden, Switzerland, United Kingdom.

H o s t s : Parasitoid of Diptera and Psocoptera: *Cacilius flavidus* (Caecilidae), *Rabdophaga rigidae* (Cecidomyiidae); *Peripsocus phaeopterus* (Peripsocidae).

New record for Turkey.

Peristenus FORSTER 1862

Peristenus digoneutis LOAN 1973

M a t e r i a l e x a m i n e d : Edirne-Hadımağa (h: 41 m), 01.v.2003, 1♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Hungary, Moldova, Poland, Ukraine.

H o s t s : Parasitoid of Hemiptera: *Empoasca solana* (Cicadellidae), *Lygus lineolaris*, *L. rugulipennis* (Miridae).

New record for Turkey.

Peristenus facialis (THOMSON 1892)

M a t e r i a l e x a m i n e d : Tekirdağ-Şarköy-Güzelköy (h: 150 m), 25.vi.2003, 1♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Finland, Hungary, Korea, Lithuania, Mongolia, Poland, Russia, Sweden, United Kingdom, Yugoslavia.

H o s t s : Parasitoid of Hemiptera: *Orthotylus marginalis*, *Psallus varians* (Miridae).

New record for Turkey.

Peristenus grandiceps (THOMSON 1892)

M a t e r i a l e x a m i n e d : Edirne-Hadımağa (h: 41 m), 28.v.1993, 1♂; Lalapaşa-Doğanköy (h: 370 m), 06.vii.1987, 1♂; Uzunköprü-Saçlımüsellim (h: 75 m), 01.viii.1992, 1♀; Kırklareli-Saka Lake (h: 150 m), 12.vi.1991, 1♂.

General Distribution: Palaearctic: Germany, Greece, Hungary, Ireland, Kazakhstan, Moldova, Netherlands, Norway, Poland, Sweden, Switzerland, United Kingdom.

Hosts: So far unknown.

New record for Turkey.

***Peristenus nitidus* (CURTIS 1833)**

Material examined: Kırklareli-Dereköy (h: 500 m), 25.iv.1985, 1♂.

General Distribution: Palaearctic: Germany, Hungary, Mongolia, Norway, United Kingdom.

Hosts: So far unknown.

New record for Turkey.

***Peristenus pallipes* (CURTIS 1833)**

Material examined: Edirne-Lalapaşa-Doğanköy (h: 370 m), 06.vi.1987, 1♀; Kırklareli-Dereköy (h: 500 m), 25.iv.1985, 1♀, 1♂.

General Distribution: Palaearctic: Albania, Armenia, Azerbaijan, Belgium, Bosnia Hercegovina, Bulgaria, China, Croatia, Czechoslovakia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Korea, Latvia, Lithuania, Moldova, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Slovenia, Spain, Switzerland, United Kingdom, Yugoslavia. Nearctic, Oriental.

Hosts: Parasitoid of Hemiptera: *Timarcha tenebricosa*, *T. tenebricosa anglica* (Chrysomelidae); *Eustrophus dermestoides* (Melandryidae); *Adelphocoris lineolatus*, *A. rapidus*, *Calacoris norvegicus*, *Capsus ater*, *Labops hirtus*, *Leptopterna dolabrata*, *Lygus borealis*, *L. desertus*, *L. elisus*, *L. hesperus*, *L. lineolaris*, *L. pratensis*, *L. rugulipennis*, *Notostira erratica*, *Plagiognathus medicagus*, *Trigonotylus coelestialium* (Miridae).

New record for Turkey.

***Peristenus picipes* (CURTIS 1833)**

Material examined: Kırklareli-Vize (h: 150 m), 25.viii.1992, 1♀; Tekirdağ-Hayrabolu (h: 50 m), 26.viii.1992, 1♀; -Susuzmüsellim (h: 110 m), 03.viii.1993, 1♀; -Muratlı (h: 60 m), 07.ix.1999, 1♀.

General Distribution: Azerbaijan, China, Croatia, Czechoslovakia, Finland, Germany, Hungary, Ireland, Italy, Kazakhstan, Lithuania, Moldova, Norway, Poland, Russia, Sweden, Switzerland, United Kingdom, Yugoslavia.

Hosts: So far unknown.

New record for Turkey.

***Peristenus relictus* (RUTHE 1856)**

M a t e r i a l e x a m i n e d : Edirne-Havsa-Abalar (h: 45 m), 01.viii.1992, 1♂; Yenikadı (h: 50 m), 14.vi.1987, 1♂; Kafkas Bağları (h: 45 m), 17.v.1987, 1♂; Tekirdağ-Ganos Mountains (h: 350 m), 14. vii.1986, 1♂; Işıklar-Mermerköy (h: 250 m), 21.vi.1987, 1♂; Yazırköy (h: 60 m), 24.vi.2003, 2♂♂.

G e n e r a l D i s t r i b u t i o n : Palaearctic: France, Germany, Hungary, Poland, Russia, Switzerland, Turkey, United Kingdom, Yugoslavia.

H o s t s : Parasitoid of Hemiptera: *Lygus hesperus*, *L. rugulipennis*, *Polymerus unifasciatus*, *Trigonotylus coelestialium* (Miridae).

***Peristenus rubricollis* (THOMSON 1892)**

M a t e r i a l e x a m i n e d : Edirne-Uzunköprü-Saçlımüsellim (h: 70 m), 01.viii.1992, 1♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Finland, Germany, Hungary, Kazakhstan, Moldova, Poland, Sweden, Switzerland, Ukraine.

H o s t s : Parasitoid of Hemiptera: *Adelphocoris lineolatus*, *Lygus rugulipennis* (Miridae).

New record for Turkey.

Wesmaelia* FORSTER 1862**Wesmaelia petiolata* (WOLLASTON 1858)**

M a t e r i a l e x a m i n e d : Kırklareli-Erenler (h: 290 m), 16.vi.1987, 1♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Afghanistan, Azerbaijan, Bulgaria, China, Czechoslovakia, Germany, Hungary, Iran, Israel, Italy, Moldova, Poland, Turkmenistan, Ukraine, United Kingdom, Uzbekistan. Nearctic, Neotropical, Oceanic, Oriental.

H o s t s : Parasitoid of Coleoptera: *Nabis alternatus*, *N. americanoferus*, *N. capsiformis* (Nabidae).

New record for Turkey.

Tribe Helorimorphini SCHMIEDEKNECHT 1907***Aridelus* MARSHALL 1887*****Aridelus egregius* (SCHMIEDEKNECHT 1907)**

M a t e r i a l e x a m i n e d : Tekirdağ-Ganos Mountains-Uçmakdere (h: 640 m), 13.vii.1986, 2♂♂

G e n e r a l D i s t r i b u t i o n : Palaearctic: Azerbaijan, Bulgaria, China, Czech Republic, Czechoslovakia, France, Germany, Korea, Moldova, Russia, Slovakia, Ukraine. Oriental.

H o s t s : Parasitoid of Hemiptera: *Aelia acuminata*, *A. cognata*, *Dolcoris bacarum*,

Eurydema ornatum, *Holcostethus vernalis*, *Palomena prasina* (Pentatomidae); *Coptosoma mucronotum*, *C. scutellatum* (Plataspidae); *Eurygaster austriaca*, *E. maura* (Scutelleridae).

New record for Turkey.

Tribe **P e r i l i t i n i** FORSTER 1862

***Perilitus* NEES 1819**

***Perilitus (Microctonus) aethiops* NEES 1834**

M a t e r i a l e x a m i n e d : Kırklareli-Erenler (h: 290 m), 16.vi.1987, 1♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Armenia, Azerbaijan, Belarus, Belgium, Croatia, Czechoslovakia, France, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Lithuania, Mongolia, Netherlands, Poland, Romania, Russia, Sweden, Switzerland, United Kingdom, Yugoslavia. Nearctic.

H o s t s : Parasitoid of Coleoptera: *Phyllotreta nemorum*, *P. vittula* (Chrysomelidae); *Hypera meles*, *H. nigrirostris*, *H. postica*, *H. variabilis*, *Sitona crinita*, *S. cylindricollis*, *S. hispidula*, *S. humeralis*, *Thylacites incanus* (Curculionidae).

New record for Turkey.

***Perilitus (Microctonus) parvicornis* (RUTHE 1856)**

M a t e r i a l e x a m i n e d : Kırklareli-Yeniceköy (h: 660 m), 16.vi.1987, 2♀♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: Germany, Italy, Moldova, Switzerland, United Kingdom.

H o s t s : So far unknown.

New record for Turkey.

***Perilitus (Microctonus) stelleri* (LOAN 1972)**

M a t e r i a l e x a m i n e d : Edirne-Hacıumur (h: 50 m), 13.vi.1987, 2♂♂; Hadımağa (h: 40 m), 24.v.1987, 7♀♀; 1♂; (h: 50 m), 17.v.1987, 1♀; (h: 41 m), 30.iii.2001, 3♂♂; 06.iv.2001, 1♂; 25.v.2001, 2♂♂; Lalapaşa (h: 200 m), 06.vi.1987, 2♂♂; Suakacağı (h: 210 m), 26.v.1993, 4♂♂; Süleoğlu (h: 80 m), 28.v.1988, 2♂♂; (h: 200 m), 07.vi.1987, 6♂♂; 31.v.1988, 1♂; Kovankaya (h: 185 m), 31.v.1988, 1♂; Kırklareli-Dereköy (h: 500 m), 25.iv.1985, 1♀; Kömürköy (h: 200 m), 08.v.1988, 1♀; Pabuçdere (h: 300 m), 08.v.1988, 1♀; Tekirdağ-Saray-Kastro (h: 110 m), 8.v.1988, 1♀.

G e n e r a l D i s t r i b u t i o n : Palaearctic: France, Germany, Hungary, Russia, Switzerland.

H o s t s : Parasitoid of Coleoptera: *H. postica*, *H. variabilis* (Curculionidae).

New record for Turkey.

Zoogeographical Remarks

The majority of the 19 species described in this study are disturbed in the Palaearctic region. They can be divided into the following groups according to their zoogeographical distributions (TAGLIANTI et al. 1999).

- Palaearctic chorotype: Chorotype of species widespread in the Palaearctic Region: Eurasia, South the Himalayan chain, Africa North of Sahara and Macaronesia. *Allurus lituratus* (HALIDAY 1835), *Centistes (Centistes) fuscipes* (NEES 1834), *Dinocampus coccinellae* (SCHRANK 1802) are represented in this chorotype in Turkey.
- Asiatic-European chorotype: Chorotype of species widespread through Eurasian continent, South to the Himalayan chain. *Allurus muricatus* (HALIDAY 1833), *Centistes (Centistes) cuspidatus* (HALIDAY 1833), *Leiophron (Euphorus) pallidistigma* CURTIS 1833, *Peristenus facialis* (THOMSON 1892), *Peristenus grandiceps* (THOMSON 1892), *Peristenus nitidus* (CURTIS 1833), *Peristenus pallipes* (CURTIS 1833), *Peristenus picipes* (CURTIS 1833), *Peristenus rubricollis* (THOMSON 1892), *Wesmaelia petiolata* (WOLLASTON 1858), *Aridelus egregius* (SCHMIEDEKNECHT 1907), *Perilitus (Microctonus) aethiops* NEES 1834 are represented in this chorotype in Turkey.
- Sibero-European chorotype: Chorotype of species widespread in Siberia and extending westwards to Europe, sometimes occurring in mountainous areas of western Asia. *Peristenus relictus* (RUTHE 1856), *Perilitus (Microctonus) stelleri* (LOAN 1972) are represented in this chorotype in Turkey.
- European chorotype: Chorotype of species widespread in Europe, with possible extension to Anatolia, Caucasus, Maghreb and Macaronesia. *Peristenus digoneutis* LOAN 1973, *Perilitus (Microctonus) parvicornis* (RUTHE 1856) are represented in this chorotype in Turkey.

The majority of the species are associated with the Asiatic-European and Palaearctic chorotypes. Turkey species constitute most of the West Palearctic species of Euphorinae. *Peristenus pallipes*, *Wesmaelia petiolata* and *Aridelus egregius* are known from some parts of the Zoogeographical region, outside Holarctic.

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Zusammenfassung

Die Arten wurden in den Jahren 1985 bis 2003 von Thrakien-Gebiet in der Türkei gesammelt. Insgesamt wurden 19 Arten festgestellt aus 8 Euphorinae gattungen. Die folgenden Arten sind neu für die Türkische Euphorinae-Fauna: *Allurus lituratus* (HALIDAY), *A. muricatus* (HALIDAY), *Aridelus egregius* (SCHMIEDEKNECHT), *Centistes (Centistes) cuspidatus* (HALIDAY), *C. (C.) fuscipes* (NEES), *Leiophron (Euphorus) pallidistigma* CURTIS, *Peristenus digoneutis* LOAN, *P. facialis* (THOMSON), *P. grandiceps* (THOMSON), *P. nitidus* (CURTIS), *P. pallipes* (CURTIS), *P. picipes* (CURTIS), *P. rubricollis* (THOMSON), *Perilitus (Microctonus) aethiops* NEES, *P. (M.) parvicornis* (RUTHE), *P. (M.) stelleri* (LOAN), *Wesmaelia petiolata* (WOLLASTON). Verbreitung und bekannte Wirte werden angegeben. Diese Untersuchung ist die erste Erforschung der Euphorinae (Hymenoptera: Braconidae) der Türkei.

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