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Taxonomical and Biogeographical Evaluation of the Subfamily Tryphoninae (Hymenoptera: Ichneumonidae) in Turkey

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ABSTRACT

The main objective of this study is to analyze faunistical, ecological, zoogeographical distribution and host data of specimens belonging to the subfamily Tryphoninae Shuckard,1840 (Hymenoptera: Ichneumonidae). The specimens were collected from different provinces in Turkey between March 1990 and October 2016. A total of 1463 specimens were identified into 95 species, 26 genera, 13 subgenera and 6 tribes. Most of the specimens were collected after the year 2000 and were considered as new records. Among them, *Netelia* (*Parophelte*s) *beschkovi* Kolarov, 1994 and *Parablastus anatolicus* Gürbüz & Kolarov, 2005 were newly described from Turkey. Also these species are endemic for Turkey. For each species details biogeographical and zooogeographical data, altitudinal distribution, seasonal dynamics, number of specimens, available host data, plants visited by adults and the first record of the species from Turkey are summarised.

Key words: Tryphoninae, new records, endemic.

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INTRODUCTION

It has taken over three billion years for life on Earth to evolve to such high complexity that we see today as biodiversity. At the same time, modern human behaviour is reducing biodiversity at an alarming pace, and the world's biota is facing its sixth mass extinction (Barnosky, et al, 2011).

Insecta is the most species rich group of organisms, and those with a parasitoid lifestyle have become exceptionally successful (Gauld, Godoy, Sithole & Ugalde Gómez, 2002; Hamilton, et al. 2010). Parasitoids are insects whose larvae develop by feeding in or on other arthropods (usually other insects), which results in the death of the parasitoid's host (Godfray, 1994). Parasitoids are species rich in the orders Hymenoptera (bees and wasps) and Diptera (flies), and a few are encountered in, e.g., Coleoptera (beetles), Neuroptera (net-winged insects) and Trichoptera (caddisflies).

Among the many thousands of Hymenopterous insects existing in the World, Ichneumonidae may still be the largest of all animal families with over 100,000 estimated species worldwide (Gauld et al, 2002). Despite the abundance, diversity, and ecological importance of Ichneumonidae, there is a dearth of ecological studies or biodiversity surveys on them in general very little work has been done on parasitoids (Schwarzfeld, 2014).

Ichneumonidae is the biggest hymenopteran family including 1601 genera and 25285 described species (Yu, Achterberg & Horstmann, 2016). Number of recorded Ichneumonidae species in Turkey was 1056 in Taxapad (Yu, Achterberg & Horstmann, 2012). As a result of many studies performed, we found several species so far unknown in Turkey. With the below mentioned contributions (Çoruh & Kolarov, 2013; Çoruh & Özbek, 2013; Çoruh, Gürbüz, Kolarov, Yurtcan, Boncukçu Özdan, 2013; Çoruh, Kolarov, & Çoruh, 2014; Çoruh, Kolarov, & Özbek, 2014; Kolarov, Çoruh, & Çoruh, 2014a, b, 2015, 2016, 2017, 2018; Kolarov, Yıldırım, Çoruh & Yüksel 2014; Özdan, 2014; Riedel, Yaman, 2014; Yurtcan & Kolarov, 2015; Çoruh & Çalmaşur, 2016; Çoruh & Kolarov, 2016; Özdan & Gürbüz, 2016; Çoruh, Kolarov & Çoruh, 2018; Riedel, Diller & Çoruh, 2018; Sarı & Çoruh, 2018; Çoruh, Kolarov & Ercelep, 2019) the number of Ichneumonidae fauna of Turkey reached to about 1259 species.

The Tryphoninae comprise a worldwide subfamily of the parasitic wasp family Ichneumonidae. This subfamily is the seventh largest subfamily of Ichneumonidae with about 57 genera and 1293 species worldwide (Yu et al, 2016). Most species of the Tryphoninae are koinobiont ectoparasitoids of Symphyta larvae, but members of some genera (e.g. Netelia) are ectoparasitoids of Lepidoptera larvae. Tryphonines have a hair-margined clypeus and two longitudinal parallel ridges occur on the first tergite. The female sometimes has stalked eggs projecting from its ovipositor (Townes, 1969).

Up to 1995 (Kolarov, 1995), only 16 Tryphoninae species belonging to 6 genera have been documented. After 1995, with contributions especially of Janko Kolarov, Murat Yurtcan, Saliha Çoruh and M. Faruk Gürbüz the numbers of Tryphoninae fauna of Turkey reached to 96 species into 25 genera.

Taxonomical and biogeographical evaluation of ichneumonids is poorly studied in Turkey. We present data on the abundance and species richness of the ichneumonid

wasps in Turkey in this study. This study will reveal the evaluation and ecological importance of the ichneumonids.

The purpose of this study is to gather all the data about subfamily Tryphoninae. In this way, the present study will provide detailed information on the subfamily Tryphoninae species have been collected and identified in Turkey. Our studies will continue and these findings will be useful for future ichneumonid studies.

MATERIAL AND METHODS

Overall, we collected a total of 1463 individuals of Ichneumonidae from 60 localities of Anatolia (Fig. 1). During the expedition, sweeping net, malaise and light traps were used to capture specimens. Also a small portion of ichneumonid species were reared from different hosts under laboratory conditions.

Fig. 1. Map of studied areas shown darker in Turkey.

The tribes, genera and species are listed in the alphabetical order. Distributional records were also used from recent Interactive Catalogue of World Ichneumonidae (Yu et al, 2012). Data on faunistic composition, ecological attributes, zoogeographical distributions, host species and plants visited by adults are provided in tables and graphs.

RESULTS AND DISCUSSION

Tryphoninae species (Fig. 2) which are used in this study and added to the literature were collected in whole of Turkey in last two decade. Tryphoninae are evaluated in terms of different situations.

Faunistic evaluations

So far, a total of 95 species of 26 genera into six tribes of Tryphoninae were recognized in Turkey. In this study, one species and one genera belonging to tribe Eclytini and Idiogrammatini, 12 species and 6 genera tribe Exenterini, 4 species and 3 genera tribe Oedemosini, 29 species and 2 genera tribe Phytodietini, 48 species and 12 tribe Tryphonini were recorded. Among the species determined, *Tryphon* (*Tryphon*) *signator* is the most found species, with 162 individuals collected. *Tryphon* (*T.*) *atriceps* (157), *Tryphon* (*T.*) *rutilator* (151) and, *Netelia* (*N.*) *fuscicornis* (107) followed this species, respectively in the research area.

Fig. 2. Common Tyrphoninae species *Tryphon signator* Gravenhorst,1829; *Netelia fuscicornis* (Holmgren,1860)

Despite these intense species, *Eridolius pictus*, *Exyston subnitidus*, *Kristotomus pumilio*, *Cladeutes discedens*, *Netelia* (*Bessobates*) *latungula*, *N.* (*N.*) *denticulator*, *N.* (*N.*) *melanura*, *N.* (*N.*) *thoracica*, *N.* (*Paropheltes*) *beschkovi*, *N.* (*P.*) *elevator*, *N.* (*P.*) *maculiventris*, *N.* (*P.*) *nomas*, *N.* (*P.*) *turanica*, *N.* (*Toxochiloides*) *krishtali*, *Ctenochira meridionator*, *Erromenus bibulus*, *E. brunicans*, *E. junior*, *E. melanotus*, *E. punctulatus*, *Polyblastus* (*Polyblastus*) *pinguis*, *P.* (*P.*) *tuberculatus*, *Tryphon* (*Stenocrotaphon*) *obtusator* and *T.* (*Symboethus*) *heliophilus* (with 1 individual) were rarely found in Turkey (Table 1). Numbers of genera per tribe are shown in the graphs (Fig. 3).

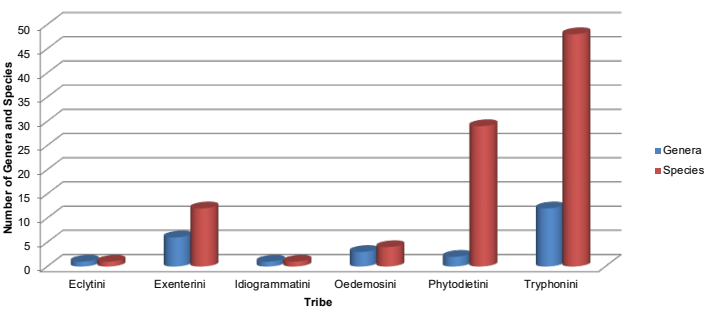

Fig. 3. Number of genera and species per tribe.

Ecological evaluations

Tryphonine specimens were collected at different altitudes in study area. These altitudes ranged from 0 m to 2500 m. We found that a total of 40 species were collected from between 0-500 m, 15 species between 501-750 m, 22 species between 751-1000 m, 38 species between 1001-1250 m, 22 species between 1251-1500 m, 27 species between 1501-1750 m, 22 species between 1751-2000 m and 26 species between 2001-2500 m (Table 1). Among them, 44 species were collected at only one altitude. *Tryphon* (*Tryphon*) *signator* and *T.* (*T.*) *zavreli* were collected from all altitudes. Despite, 42% of all species were collected between 0-500 m altitudes, 15% of all species were collected between 501-750 m (Figure 4).

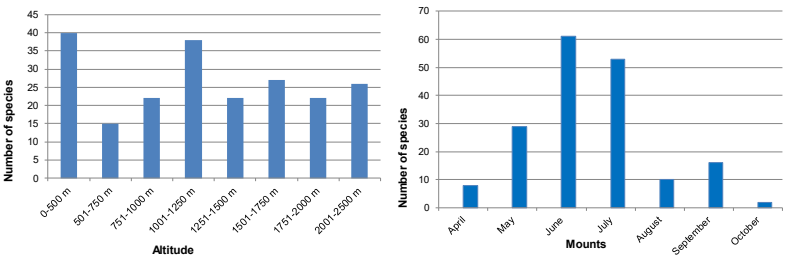

Fig. 4. Distributions of species according to altitude and months.

To look at seasonal activities of these species in Turkey, species were generally collected between April and October. It is a fact that tryphonine species are active on seven months of the year. However, they had more abundancy during June and July (Table 1). As seen in table 1, *Acrotomus succinctus, Netelia* (*Netelia*) *fuscicornis* and *N.* (*N.*) *testacea* were collected in five different months a year. Also 51 species were collected only in one month.

With these results we can assert that, *N.* (*N.*) *fuscicornis* and *T.* (*T.*) *signator* were found to be the most abundant species as it was collected from different altitudes and different climate conditions.

Zoogeographical Evaluations

Samples were collected from different localities of 7 regions in Turkey during the study. As reported in the table 1, it is seen that, most of the samples (50) were collected from the Eastern Anatolia region and, 35, 34, 33, 29, 22, 3 species were collected from Mediterranean, Marmara, Central Anatolia, Black Sea, Aegean and Southeastern Anatolia region respectively (Fig. 5). Table 2 shows the province in the seven different regions where each species was collected. It is understood that when tables 1 and 2 are analyzed, *Netelia* (*Netelia*) *fuscicornis, N.* (*N.*) *testacea, Tryphon* (*Tryphon*) *atriceps* and *T.* (*T.*) *rutilator* were collected from six regions. *Tryphon* (*T.*) *signator, T.* (*T.*) *thomsoni* and *T.* (*T.*) *zavreli* were collected from all regions. We can say that, some of the species of *Tryphon* have a very wide distribution in Turkey.

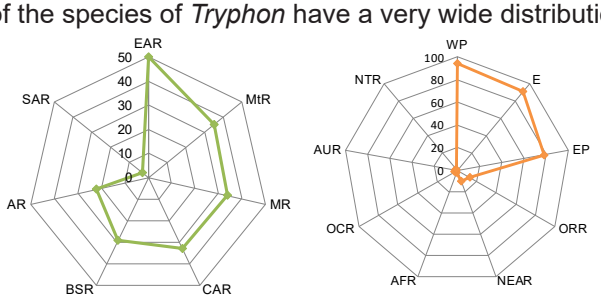

Fig. 5. Distribution of species according to regions of Turkey and world. Geographical regions (GR): AR: Aegean Region, BSR: Black Sea Region, CAR: Central Anatolia Region, EAR: Eastern Anatolia Region, MR: Marmara Region, MtR: Mediterranean Region, SAR: Southeastern Anatolia. Zoogeographical regions (ZR): AFR: Afrotopical Region, AUR: Australian Region, E: Europe, EP: Eastern Palaearctic, NEAR: Nearctic Region, NTR: Neotropical, ORR: Oriental, WP: Western Palaarctic.

Table 1. Data of collected species: Individual numbers (IN), vertical distribution (VD), seasonal dynamics (SD), geographical regions (GR), zoogeographical regions (ZR), host records (HR), plant visited records (PVR), first record of Turkey (FRT) of specimens.

Names of Taxa	IN	VD	SD	GR	ZR	HR	PVR	FRT
TRIBE ECLYTINI TOWNES &TOWNES, 1945								
Genus *Eclytus* Holmgren, 1857								
Subgenus *Zapedias* Forster, 1869								
Eclytus (*Zapedias*) *exornatus* (Gravenhorst, 1829)	2	F	J	MtR	EP, E, WP			Gürbüz & Kolarov, 2006
TRIBE EXENTERINI FÖRSTER, 1869								
Genus *Acrotomus* Holmgren,1857								
Acrotomus lucidulus Gravenhorst, 1829	14	A, D, E	J, Jl	AR, BSR, EAR, MR, MtR	EP, E, WP			Yurtcan & Beyarslan, 2002
Acrotomus succinctus (Gravenhorst, 1829)	17	A, F, D, G	M, J, Jl, Aug, S	AR, BSR, EAR, MR,	EP, E, NEAR, ORR, WP			Kolarov & Beyarslan, 1994
Genus *Cycasis* Townes,1965								
Cycasis rubiginosa Gravenhorst, 1829	2	H	J	EAR	EP, E, WP			Çoruh, Özbek & Kolarov, 2005
Genus *Eridolius* Förster,1869								
Eridolius dorsator (Thunberg, 1822)	2	F, G	J	EAR	EP, E, WP			Kolarov, 2009
Eridolius pictus (Gravenhorst, 1829)	1	E	J	EAR	EP, E, NEAR, WP			Kolarov et al, 2014c
Genus *Exenterus* Hartig,1837								
Exenterus abruptorius (Thunberg, 1822)	4	D	M, J	CAR, MtR	EP, E, NEAR, WP	X	X	Özdemir, 2001
Exenterus ictericus (Gravenhorst, 1829)	5	F	Ap	BSR	E, WP			*Yurtcan, Kolarov & Beyarslan,* 2006
Genus *Exyston* Schiodt, 1839								
Exyston montanus Kerrich, 1975	3	F	J	CAR, EAR	EP, E, WP			Kolarov, 1995
Exyston sponsorius Fabricius, 1781	14	A, B, H, F	Ap, M, J, Jl	AR, CAR, EAR, MR	EP, E, WP			Yurtcan & Beyarslan, 2002
Exyston subnitidus (Gravenhorst, 1829)	1	?	?	Anatolia	E, WP			Kerrich, 1952
Genus *Kristotomus* Mason, 1962								
Kristotomus laetus (Gravenhorst, 1829)	16	A, C, F	M, J, Jl	AR, EAR, MR, MtR,	EP, E, WP			Kolarov & Beyarslan, 1994
Kristotomus pumilio (Holmgren, 1857)	1	A	J	BSR	E, WP			Çoruh et al, 2014a
TRIBE IDIOGRAMMATINI CUSHMAN, 1942								
Genus *Idiogramma* Förster, 1869								
Idiogramma sp.	2	D	M	MtR	EP, E, WP			Boncukçu, 2008

Table 1. Continued

Names of Taxa	IN	VD	SD	GR	ZR	HR	PVR	FRT
TRIBE OEDEMOSINI WOLDSTEDT, 1877								
Genus *Cladeutes* Townes, 1969								
Cladeutes discedens Woldsteth,1872	1	F	JI	MtR	EP, E, WP			Kolarov &Beyarslan, 1994
Genus *Oedemopsis* Tschek,1869								
Oedemopsis scabricula Gravenhorst, 1829	7	A, F	JI	BSR, EAR, MR	EP, E, NEAR, ORR, WP			Çoruh et al, 2005
Genus *Thymaris* Förster, 1869								
Thymaris contaminatus (Gravenhorst,1829)	3	G	S	MR	E, WP			Kolarov, Yurtcan & Beyarslan, 1997
Thymaris tener (Gravenhorst,1829)	3	F	J	MR	EP, E, WP			Yaman, 2014
TRIBE PHYTODIETINI HELLEN; 1915								
Genus *Netelia* Gray, 1860								
Subgenus *Bessobates* Townes, Townes & Gupta, 1961								
Netelia (*Bessobates*) *cristata* (Thomson, 1888)	12	A, B	J, JI, O	AR, MR	EP, E, ORR, WP			Yurtcan & Beyarslan, 2002
Netelia (*Bessobates*) *latungula* (Thomson, 1888)	1	A, H	JI	CAR, MR	EP, E, NEAR, WP		X	Fahringer, 1922
Netelia (*Bessobates*) *virgata* (Fourcroy, 1785)	3	A, B, D, H	J, JI, S	BSR, CAR, MR	EP, E, ORR, WP	X	X	Fahringer, 1922
Subgenus *Netelia* Gray, 1860								
Netelia (*Netelia*) *denticulator* Aubert, 1969	1	B	S	CAR	EP, E, WP			Özdemir, 2001
Netelia (*Netelia*) *dilatata* (Thomson, 1888)	59	H, C, D, E, F	M, J, JI	CAR, EAR, MtR	EP, E, WP		X	Kolarov, Özbek & Yıldırım, 1999
Netelia (*Netelia*) *fuscicornis* Holmgren, 1860	107	A, B, C, D, H, E, G	M, J, JI, S, O	AR, BSR, CAR, EAR, MR, MtR	EP, E, ORR, WP			Tolkanitz, 1981
Netelia (Netelia) melanura (Thomson, 1888)	1	D	JI	MtR	EP, E, WP			Delrio, 1975
Netelia (Netelia) ocellaris (Thomson, 1888)	10	A, C, D, E	J, JI, Aug	AR, MR	EP, E, ORR, WP			Yurtcan & Beyarslan, 2002
Netelia (*Netelia*) *opacula* (Thomson, 1888)	2	C, H	J	CAR, MtR	EP, E, OCR, ORR, WP			Sedivy, 1959
Netelia (*Netelia*) *praevalvator* Delrio, 1971	14	A, C	J, JI	AR	E, WP			Yurtcan, Kolarov & Beyarslan, 2006
Netelia (*Netelia*) *rufescens* (Tosquinet, 1896)	7	A, C	J, JI, Aug	AR, MR	AFR, E, WP			Yurtcan & Beyarslan, 2002,
Netelia (*Netelia*) *silantjewi* Kokujev, 1899	7	A, C	J, JI, Aug, S	AR, MR	EP, E, ORR, WP			Kolarov et al, 1997
Netelia (*Netelia*) *testacea* (Gravenhorst, 1829)	56	A, B, C, D, G,	M, J, JI, Aug, S	AR, BSR, CAR, EAR, MR, MtR,	AFR, AUR, EP, E, NTR, OCR, ORR, WP	X		Szepligeti, 1911
Netelia (*Netelia*) *thoracica* (Woldstedt,1880)	1	D	JI	EAR	EP, E, ORR, WP			Yaman, 2014
Netelia (*Netelia*) *valvator* Aubert, 1968	25	A, G	Ap, J, JI, Aug	AR, BSR, EAR, MR, MtR	EP, E, WP			Kolarov, 1994

Table 1. Continued

Names of Taxa	IN	VD	SD	GR	ZR	HR	PVR	FRT
TRIBE PHYTODIETINI HELLEN; 1915								
Genus *Netelia* Gray, 1860								
Subgenus *Paropheltes* Cameron, 1907								
Netelia (*Paropheltes*) *beschkovi* Kolarov, 1994	1	A	JI	CAR	WP			Kolarov, 1995
Netelia (*Paropheltes*) *elevator* Aubert, 1971	1	H	JI	EAR	E, WP			Çoruh et al, 2005
Netelia (*Paropheltes*) *maculiventris* Kokujev, 1915	1	H	J	EAR	EP, E, WP			Çoruh et al, 2005
Netelia (*Paropheltes*) *nigricarpus* (Thomson, 1888)	4	A, C	J, JI	AR	EP, E, WP			Yurtcan et al, 2006
Netelia (*Paropheltes*) *nomas* Kokujev, 1899	1	H	JI	EAR	EP, E, WP			Çoruh et al, 2005
Netelia (*Paropheltes*) *parvula* (Meyer, 1927)	2	C	J	CAR	EP, E, WP		X	Özdemir, 2001
Netelia (Paropheltes) tarsata (Brischke, 1880)	3	C	S	CAR	EP, E, NEAR, WP			Özdemir, 2001
Netelia (Paropheltes) *terebrator (Ulbricht, 1922)*	3	D	J, S	CAR	EP, E, WP		X	Özdemir, 2001
Netelia (*Paropheltes*) *turanica* (Kokujev, 1899)	1	G	JI	EAR	E, WP			Çoruh et al, 2014b
Subgenus *Prosthodocis* Enderlein 1912								
Netelia (*Prosthodocis*) *japonica* Uchida, 1928	2	A, G	JI	EAR, MR	EP, E, ORR, WP			Yurtcan & Beyarslan, 2002
Subgenus *Toxochiloides* Tolkanitz, 1974								
Netelia (*Toxochiloides*) *krishtali* Tolkanitz, 1971	1	D	JI	EAR	EP, E, WP			Kolarov, 1995
Genus *Phytodietus* Gravenhorst, 1829								
Phytodietus griseanae Kerrich, 1962	2	H	S	CAR	EP, E, WP			Özdemir, 2001
Phytodietus montanus Tolkanitz, 1979	5	D	M, J	AR, MtR	EP, E, WP			Gürbüz & Kolarov, 2006
Phytodietus polyzonias (Foerster, 1771)	27	A, C, D, E	M, J	CAR, MR	EP, E, WP	X	X	Özdemir, 2001
TRIBE TRYPHONINI SHUCKARD 1840								
Genus *Aderaeon* Townes, Townes, 1949								
Aderaeon hamatum Kasparyan, 1971	10	F, H	J, JI	BSR, EAR	EP, E, WP			Kolarov et al, 1999
Genus *Boethus* Förster, 1869								
Boethus thoracicus (Giraud, 1872)	2	F, H	J, JI	EAR, MtR	EP, E, WP			Gürbüz & Kolarov, 2006
Genus *Cosmoconus* Förster, 1869								
Subgenus *Cosmoconus* Förster,1869								
Cosmoconus (*C.*) *ceratophorus* (Thomson, 1888)	6	B, E, F, H	J, JI, Aug, S	BSR, EAR	EP, E, WP			Çoruh et al, 2005

Table 1. Continued

Names of Taxa	IN	VD	SD	GR	ZR	HR	PVR	FRT
TRIBE TRYPHONINI SHUCKARD 1840								
Genus *Cosmoconus* Förster, 1869								
Subgenus *Cosmoconus* Förster,1869								
Cosmoconus (*C.*) *elongator* (Fabricius, 1775)	3	G, H	J, Jl, Aug	BSR, CAR, EAR	EP, E, WP		X	Fahringer, 1921
Cosmoconus (*C.*) *meridionator* Aubert, 1963	5	E, H	Ap, S	EAR	EP, E, WP			Kolarov & Çoruh, 2012
Genus *Ctenochira* Förster, 1855								
Ctenochira sp.	1	H	Jl	EAR	EP, E, NEAR, ORR, WP			Kolarov & Çalmaşur, 2011
Ctenochira angulata (Thomson, 1883)	3	A, D	J	BSR, MR	EP, E, WP			Yurtcan & Beyarslan, 2002
Ctenochira meridionator Aubert, 1969	1	A	J	BSR	EP, E, WP			Çoruh et al, 2014a
Ctenochira pratensis (Gravenhorst, 1829)	2	E	J	EAR	EP, E, WP			Kolarov & Çoruh, 2012
Genus *Erromenus* Holmgren,1857								
Erromenus bibulus Kasparyan, 1973	1	G	J	BSR	EP, E, WP			Çoruh et al, 2005
Erromenus brunicans Dalla Torre,1901	1	D	J	BSR, MtR	?			Gürbüz & Kolarov, 2006
Erromenus junior Thunberg, 1822	1	G	Jl	EAR	EP, E, WP			Çoruh et al, 2005
Erromenus melanonotus (Gravenhorst, 1829)	1	E	Jl	CAR	EP, E, WP			Kohl, 1905
Erromenus punctulatus Holmgren, 1857	1	F	J	EAR	EP, E, NEAR, WP			Kolarov & Çoruh 2012
Subgenus *Aderaeon* Townes & Townes, 1949								
Erromenus (*Aderaeon*) *hamatus* Kasparyan, 1971	4	G, H	J, Jl	BSR, EAR	EP, E, WP			Kolarov et al, 1999
Genus *Dyspetes* F*örster*, 1868								
Dyspetes arrogator Heinrich, 1949	2	A	J	MR	EP, E, ORR, WP			Yurtcan &Beyarslan, 2002
Genus *Monoblastus* Hartig, 1837								
Monoblastus brachyacanthus (Gmelin, 1790)	70	A, B, D, E, G, H	Ap, M, J, Jl	BSR, CAR, EAR, MR, MTR	EP, E, WP			Kolarov & Beyarslan, 1994
Monoblastus discedens (Schmiedeknecht, 1912)	2	F	J	MtR	E, WP			Gürbüz & Kolarov, 2006
Monoblastus fulvescens Fonscolombe, 1849	5	A, H, G	J, Jl	EAR, MR	E, WP			Kolarov & Beyarslan, 1994
Monoblastus luteomarginatus (Gravenhorst, 1829)	5	A	M, J	MtR	EP, E, WP			Kolarov & Beyarslan, 1994
Monoblastus marginellus (Gravenhorst, 1829)	60	A, D, F	M, J, Jl, Aug	AR, CAR, MtR, MR	E, WP			Kolarov & Beyarslan, 1994

Table 1. Continued

Names of Taxa	IN	VD	SD	GR	ZR	HR	PVR	FRT
TRIBE TRYPHONINI SHUCKARD 1840								
Genus *Neleges* Förster, 1868								
Neleges proditor (Gravenhorst, 1829)	19	A, C, D	J, JI	AR, MR, EAR, MtR	EP, E, WP			Yurtcan & Beyarslan, 2002
Genus *Otoblastus* Förster, 1869								
Otoblastus luteomarginatus (Gravenhorst, 1829)	26	A, E, F	Ap, M, J	CAR, EAR, MR, MtR	EP, E, WP			Kolarov & Beyarslan, 1994
Genus *Parablastus* Constantineanu, 1973								
Parablastus anatolicus Gürbüz & Kolarov, 2005	2	D	J	MtR	WP			Gürbüz & Kolarov, 2005
Parablastus ibericus Kasparyan, 1999	2	D, E	JI	MtR	WP			Gürbüz & Kolarov, 2005
Genus *Polyblastus* Hartig, 1837								
Subgenus *Labroctonus* F*örster*, 1869								
Polyblastus (*Labroctonus*) *alternans* Schiødte,1838	11	A, B, G	J, JI, S	MR, MtR	EP, E, WP, NEAR			Kolarov et al, 1997
Subgenus *Polyblastus* Hartig, 1837								
Polyblastus (*Polyblastus*) *cothurnatus* Gravenhorst, 1829	5	B, D, E, F	M, J, JI	BSR, EAR	EP, E, WP			Çoruh et al, 2005
Polyblastus (*Polyblastus*) *pinguis* (Gravenhorst, 1820)	1	C	J	CAR	EP, E, WP			Yaman, 2014
Polyblastus (*Polyblastus*) *tuberculatus* Teunissen, 1953	1	D	J	CAR	EP, E, WP			Yaman 2014
Polyblastus (*Polyblastus*) *varitarsus* (Gravenhorst, 1829)	3	D, G	JI, S	BSR, EAR	EP, E, NEAR, WP			Kolarov & Çoruh 2012
Genus *Thibetoides* Davis,1897								
Thibetoides acerbus Victorov, 1964	3	D	M	EAR, MtR	EP, E, WP			Gürbüz & Aksoylar, 2004
Genus *Tryphon* Fallen, 1813								
Subgenus *Tryphon* Fallen, 1813								
Tryphon (*Tryphon*) *abditus* Kasparyan, 1969	24	C, D, F, H	M, J, JI, Aug	BSR, CAR, EAR	EP, E, WP			Çoruh et al, 2005
Tryphon (*Tryphon*) *atriceps* Stephens, 1835	157	A, B, C, D F, H,	A, M, J, JI	AR, BSR, CAR, EAR, MtR, MR,	EP, E, WP			Kolarov et al, 1999
Tryphon (*Tryphon*) *caucasicus* Kasparyan, 1969	5	D, F, G	JI	BSR; EAR	EP, E, WP			Kolarov et al, 1999
Tryphon (*Tryphon*) *latrator* (Fabricius,1781)	8	A, D	M	MtR, MR	EP, E, WP			Gürbüz & Aksoylar, 2004
Tryphon (*Tryphon*) *psilosagator* Aubert,1966	19	A, D, E, F	Ap, M, JI	EAR, MR	EP, E, WP			Kolarov & Beyarslan, 1994
Tryphon (T.) rarus Kasparyan, 1969	7	D	M	MtR	E, WP			Gürbüz & Kolarov, 2006
Tryphon (*Tryphon*) *relator* (Thunberg, 1822)	3	A, G	JI	EAR, MR	EP, E, WP			Kolarov & Çoruh 2012

Table 1. Continued

Names of Taxa	IN	VD	SD	GR	ZR	HR	PVR	FRT
TRIBE TRYPHONINI SHUCKARD 1840								
Genus *Tryphon* Fallen, 1813								
Subgenus *Tryphon* Fallen, 1813								
Tryphon (*Tryphon*) *rutilator* Linnaeus, 1761	151	A, B, C, D, E, G, H	M, J, Jl	AR, BSR, CAR, MtR, MR, EAR	EP, E, WP		X	Fahringer, 1922
Tryphon (*Tryphon*) *signator* Gravenhorst, 1829	162	A, B, C, D, E, F, G, H	Ap, M, J, Jl	AR, BSR, CAR, EAR, MR, MtR, SAR	EP, E, WP			Kolarov, 1987
Tryphon (*Tryphon*) *subsulcatus* (Holmgren, 1857)	3	E, H	J	CAR, EAR	EP, E, WP			Çoruh et al, 2005
Tryphon (*Tryphon*) *talitzkii* Telenga, 1930	11	F	M, J, Jl	BSR, EAR, MtR	E, WP			Çoruh et al, 2005
Tryphon (*Tryphon*) *thomsoni* Roman, 1939	114	A, B, C, D, E, F, G	M, J, Jl, S	AR, BSR,CAR, EAR, MR, MtR, SAR	EP, E, WP			Kolarov & Beyarslan, 1994
Tryphon (*Tryphon*) *trochanteratus* Holmgren, 1855	19	A, C, D, E	M, J, Jl, S	AR, BSR, CAR, EAR, MtR	EP, E, WP			Fahringer, 1922
Tryphon (*Tryphon*) *zavreli* Gregor, 1939	59	A, B, C, D, E, F, G, H	M, J, Jl	AR, BSR, CAR, EAR, MtR, MR, SAR	EP, E, WP			Kolarov, 1987
Subgenus *Stenocrotaphon* Kasparyan, 1969								
Tryphon (*Stenocrotaphon*) *obtusator* (Thunberg, 1824)	1	D	M	CAR	EP, E, WP			Yaman, 2014
Tryphon (*Stenocrotaphon*) *subsulcatus* Holmgren, 1857	2	E	J	CAR, EAR	EP, E, WP			Çoruh et al, 2005
Subgenus *Symboethus* Foerster, 1869								
Tryphon (*Symboethus*) *heliophilus* Gravenhorst, 1829	1	A	M	MtR	EP, E, WP			Yaman, 2014

Vertical distribution (VD) (metre): A: 0-500 m, B: 501-750 m, C: 751-1000 m, D: 1001-1250 m, E: 1251-1500 m, F: 1501-1750 m, G: 1751-2000 m, H: 2001-2500 m. Seasonal dynamics (SD): A: April, M: May, J: June, Jl: July, A: August, S: September, O: October. Geographical regions (GR): AR: Aegean Region, BSR: Black Sea Region, CAR: Central Anatolia Region, EAR: Eastern Anatolia Region, MR: Marmara Region, MtR: Mediterranean Region, SAR: Southeastern Anatolia. Zoogeographical regions (ZR): AFR: Afrotopical Region, AUR: Australian Region, E: Europe, EP: Eastern Palaearctic, NEAR: Nearctic Region, NTR: Neotropical, ORR: Oriental, WP: Western Palaarctic.

Table 2. Provinces and references of collected species in Turkey.

Names of Taxa	Distributions in Turkey	References
TRIBE ECLYTINI TOWNES & TOWNES, 1945		
Genus *Eclytus* Holmgren, 1857		
Subgenus *Zapedias* Förster, 1869		
Eclytus (*Zapedias*) *exornatus* (Gravenhorst, 1829)	Isparta	Gürbüz & Kolarov, 2006; Gürbüz, Kırtay & Birol, 2009b; Yaman, 2014
TRIBE EXENTERINI FÖRSTER, 1869		
Genus *Acrotomus* Holmgren,1857		
Acrotomus lucidulus Gravenhorst, 1829	Afyon, Denizli, Edirne, Isparta, Malatya, Muğla, Rize	Yurtcan & Beyarslan, 2002; Çoruh et al, 2014b; Çoruh et al, 2005; Yurtcan et al, 2006; Gürbüz & Kolarov, 2006, Yaman 2014
Acrotomus succinctus (Gravenhorst, 1829)	Bilecik, Burdur, Çanakkale, Edirne, Elazığ, Erzurum, Isparta, Istanbul, Izmir, Muğla, Tekirdağ, Rize, Uşak	Kolarov & Beyarslan, 1994; Kolarov et al, 1997; Kolarov et al, 1999; Gürbüz & Kolarov, 2006; Beyarslan, Erdoğan, Çetin & Aydoğdu, 2006, Yurtcan et al, 2006; Gürbüz et al, 2009b, Kolarov & Çalmaşur, 2011, Özdan, 2014; Çoruh et al, 2014a, 2014b; Yaman, 2014
Genus *Cycasis* Townes,1965		
Cycasis rubiginosa Gravenhorst, 1829	Bayburt	Çoruh et al, 2005; Çoruh et al, 2014b; Yaman, 2014
Genus *Eridolius* Förster,1869		
Eridolius dorsator (Thunberg, 1822)	Erzurum, Tunceli	Kolarov, 2009; Yaman, 2014
Eridolius pictus (Gravenhorst, 1829)	Erzurum	Kolarov et al, 2014c, Çoruh et al, 2014b
Genus *Exenterus* Hartig,1837		
Exenterus abruptorius (Thunberg, 1822)	Konya, Isparta	Özdemir, 2001; Yaman, 2014, Özdan, 2014; Özdan & Gürbüz, 2016
Exenterus ictericus (Gravenhorst, 1829)	Kastamonu	Yurtcan et al, 2006, Yaman, 2014
Genus *Exyston* Schiodt, 1839		
Exyston montanus Kerrich, 1975	Erzurum, Sivas	Kolarov, 1995; Yaman, 2014
Exyston sponsorius Fabricius, 1781	Afyon, Aksaray, Bayburt, Erzurum, Edirne, Muğla, Uşak	Yurtcan & Beyarslan, 2002; Çoruh et al, 2005; Yurtcan et al, 2006; Çoruh & Özbek, 2008; Çoruh et al, 2014b; Yaman, 2014; Çoruh & Çalmaşur, 2016
Exyston subnitidus (Gravenhorst, 1829)	Anatolia	Kerrich, 1952; Kolarov, 1995; Yaman, 2014
Genus *Kristotomus* Mason, 1962		
Kristotomus laetus (Gravenhorst, 1829)	Adana, Afyon, Bayburt, Edirne, Denizli, Kırklareli	Kolarov & Beyarslan, 1994; Kolarov et al, 1999, Yurtcan & Beyarslan, 2002, Yurtcan et al, 2006; Çoruh et al, 2014b; Yaman, 2014
Kristotomus pumilio (Holmgren, 1857)	Rize	Çoruh et al, 2014a
TRIBE IDIOGRAMMATINI CUSHMAN, 1942		
Genus *Idiogramma* Förster, 1869		
Idiogramma sp.	Isparta	Boncukçu, 2008
TRIBE OEDEMOSINI WOLDSTEDT, 1877		
Genus *Cladeutes* Townes, 1969		
Cladeutes discedens Woldsteth,1872	Hatay	Kolarov & Beyarslan, 1994; Yaman 2014
Genus *Oedemopsis* Tschek,1869		
Oedemopsis scabricula Gravenhorst, 1829	Erzurum, Giresun, Malatya, Ordu, Rize, Tekirdağ	Çoruh et al, 2005; Beyarslan et al, 2006; *Çoruh* et al, 2014a; 2014b; Yaman, 2014
Genus *Thymaris* Forster, 1869		
Thymaris contaminatus (Gravenhorst,1829)	Çanakkale	Kolarov et al, 1997
Thymaris tener (Gravenhorst,1829)	Çanakkale	Yaman, 2014

Table 2. Continued.

Names of Taxa	Distributions in Turkey	References
TRIBE PHYTODIETINI HELLEN, 1915		
Genus *Netelia* Gray, 1860		
Subgenus *Bessobates*Townes, Townes & Gupta, 1961		
Netelia (*Bessobates*) *cristata* (Thomson, 1888)	Afyon, Denizli, Edirne, Muğla	Yurtcan & Beyarslan, 2002, Yurtcan et al, 2006, Yaman, 2014
Netelia (*Bessobates*) *latungula* (Thomson, 1888)	Ankara, Izmit	Fahringer, 1922; Kolarov, 1995; Yaman, 2014
Netelia (*Bessobates*) *virgata* (Fourcroy, 1785)	Ankara, Bolu, Düzce, Kastamonu	Fahringer, 1922; Kolarov, 1995; Okyar & Yurtcan, 2007; Yaman, 2014
Subgenus *Netelia* Gray, 1860		
Netelia (*Netelia*) *denticulator* Aubert, 1969	Eskişehir	Özdemir, 2001; Yaman, 2014
Netelia (*Netelia*) *dilatata* (Thomson, 1888)	Ankara, Elâzığ, Erzurum, Eskişehir, Isparta, Konya, Malatya, Sivas	Kolarov et al, 1999, Özdemir, 2001; Gürbüz & Kolarov, 2006; Gürbüz et al, 2009b; Birol, 2010; Yaman, 2014; Özdan, 2014, Çoruh et al, 2014b; Çoruh & Kolarov, 2016; Özdan & Gürbüz, 2016
Netelia (*Netelia*) *fuscicornis* Holmgren, 1860	Adana, Afyon, Ankara, Balıkesir, Bayburt, Burdur, Bursa, Çankırı, Edirne, Elazığ, Erzincan, Erzurum, Eskişehir, Hatay, Isparta, Izmir, Kahramanmaraş, Malatya, Manisa, Nevşehir, Kayseri, Kırıkkale, Kırklareli, Kırşehir, Konya, Tekirdağ, Tunceli, Van	Tolkanitz, 1981; Kohl, 1905; Delrio, 1975, Öncüer, 1991; Kolarov, 1994; Kolarov & Beyarslan, 1994; Kolarov, 1995; Kolarov et al, 1997; Kolarov et al, 1999; Özdemir, 2001; Yurtcan & Beyarslan, 2002; Gürbüz, 2005; Çoruh et al, 2005, Gürbüz & Kolarov, 2006; Beyarslan et al, 2006; Yurtcan et al, 2006, Gürbüz, Aksoylar & Boncukçu, 2009a; Gürbüz et al, 2009b; Birol, 2010; Eroğlu, Kıraç & Birol, 2011; Çoruh et al, 2014b; Yaman, 2014; Çoruh & Çalmaşur, 2016
Netelia (*Netelia*) *melanura* (Thomson, 1888)	Kırıkkale, İstanbul	Delrio, 1975; Yaman, 2014
Netelia (*Netelia*) *ocellaris* (Thomson, 1888)	Afyon, Edirne, Izmir, Muğla, Tekirdağ, Uşak	Yurtcan & Beyarslan, 2002; Yurtcan et al, 2006, Boncukcu, 2008; Birol, 2010; Yaman, 2014
Netelia (*Netelia*) *opacula* (Thomson, 1888)	Adana, Nevşehir	Sedivy, 1959; Öncüer, 1991;Yaman, 2014
Netelia (*Netelia*) *praevalvator* Delrio 1971	Afyon, Denizli	Yurtcan et al, 2006; Yaman, 2014
Netelia (*Netelia*) *rufescens* (Tosquinet, 1896)	Afyon, Edirne, Izmir, Kırklareli, Muğla, Uşak	Yurtcan & Beyarslan, 2002; Yurtcan et al, 2006; Yaman, 2014
Netelia (*Netelia*) *silantjewi* Kokujev, 1899	Afyon, Balıkesir, Bursa, Kırklareli, Muğla, Uşak	Kolarov et al, 1997; Yurtcan & Beyarslan, 2002; Yurtcan et al, 2006; Yaman, 2014
Netelia (*Netelia*) *testacea* (Gravenhorst, 1829)	Afyon, Adana, Bursa, Edirne, Elazığ, Erzincan, Eskişehir, Istanbul, Izmir, Kayseri, Kırıkkale, Kırklareli, Manisa, Malatya, Muğla, Nevşehir, Tekirdağ, Trabzon, Tunceli	Szepligeti, 1911; Schimitschek, 1944; Sedivy, 1959; Townes, Momoi & Townes, 1965; Delrio, 1975; Tolkanitz, 1981; Öncüer 1991; Kolarov, 1994; Kolarov & Beyarslan, 1994; Kolarov, 1995; Kolarov et al, 1997; Özdemir, 2001; Yurtcan et al, 2006; Yaman, 2014
Netelia (*Netelia*) *thoracica* (Woldstedt,1880)	Malatya	Yaman, 2014
Netelia (*Netelia*) *valvator* Aubert, 1968	Afyon, Edirne, Erzurum, Isparta, Izmir, Manisa, Muğla, Tekirdağ, Trobzon	Kolarov, 1994, 1995; Kolarov et al, 1999; Yurtcan & Beyarslan, 2002; Yurtcan et al, 2006; Boncukçu, 2008; Çoruh et al, 2014b
Subgenus *Paropheltes* Cameron,1907		
Netelia (*Paropheltes*) *beschkovi* Kolarov, 1994	Nevşehir	Kolarov, 1995;Yaman, 2014
Netelia (*Paropheltes*) *elevator* Aubert, 1971	Erzurum	Çoruh et al, 2005; Çoruh et al, 2014b; Yaman, 2014
Netelia (*Paropheltes*) *maculiventris* Kokujev, 1915	Erzurum	Çoruh et al, 2005, Yaman, 2014
Netelia (Paropheltes) nigricarpus (Thomson, 1888)	Afyon, Muğla, Uşak	Yurtcan et al, 2006, Yaman, 2014
Netelia (*Paropheltes*) *nomas* Kokujev, 1899	Erzurum	Çoruh et al, 2005; Çoruh et al, 2014b; Yaman, 2014

Table 2. Continued.

Names of Taxa	Distributions in Turkey	References
TRIBE PHYTODIETINI HELLEN, 1915		
Genus *Netelia* Gray, 1860		
Subgenus *Paropheltes* Cameron,1907		
Netelia (*Paropheltes*) *parvula* (Meyer, 1927)	Ankara	Özdemir, 2001; Yaman, 2014
Netelia (Paropheltes) tarsata (Brischke, 1880)	Çankırı	Özdemir,2001, Yaman, 2014
Netelia (Paropheltes) terebrator (Ulbricht, 1922)	Kırşehir	Özdemir, 2001; Yaman, 2014
Netelia (Paropheltes) turanica (Kokujev, 1899)	Erzurum	Çoruh et al, 2014b; Yaman, 2014
Subgenus *Prosthodocis* Enderlein, 1912		
Netelia (*Prosthodocis*) *japonica* Uchida, 1928	Edirne, Erzurum	Yurtcan & Beyarslan, 2002; Çoruh et al, 2005; Çoruh et al, 2014b; Yaman, 2014
Subgenus *Toxochiloides* Tolkanitz, 1974		
Netelia (Toxochiloides) krishtali Tolkanitz, 1971	Denizli	Kolarov, 1995; Yaman, 2014
Genus *Phytodietus* Gravenhorst, 1829		
Phytodietus griseanae Kerrich, 1962	Çankırı	Özdemir, 2001; Yaman, 2014
Phytodietus montanus Tolkanitz, 1979	Denizli, Isparta	Gürbüz & Kolarov, 2006; Yaman, 2014
Phytodietus polyzonias (Foerster, 1771)	Ankara, Çankırı, Istanbul, Kırıkkale, Konya, Nevşehir, Niğde	Özdemir, 2001; Yurtcan & Beyarslan, 2002; Yaman, 2014
TRIBE TRYPHONINI SHUCKARD, 1840		
Genus *Aderaeon* Townes & Townes, 1949		
Aderaeon hamatum Kasparyan, 1971	Erzurum, Bayburt	Kolarov et al, 1999; Kolarov & Çoruh 2012; Kolarov et al, 2016; Yaman, 2014
Genus *Boethus* Förster, 1869		
Boethus thoracicus (Giraud, 1872)	Burdur, Elazığ	Gürbüz & Kolarov, 2006, Yaman, 2014
Genus *Cosmoconus* Förster, 1869		
Subgenus *Cosmoconus* Förster, 1869		
Cosmoconus (*C.*) *ceratophorus* (Thomson, 1888)p	Artvin, Erzurum, Rize	Çoruh et al, 2005; Kolarov & Çoruh, 2012; *Çoruh* et al, 2014a, 2014b; Yaman, 2014
Cosmoconus (*C.*) *elongator* (Fabricius, 1775)	Erzurum, Hatay, Bulgar Mt. (Konya, Niğde Mersin)	Fahringer, 1921; Kolarov, 1995; Kolarov & Çoruh, 2012; Çoruh et al, 2014b; Yaman, 2014
Cosmoconus (*C.*) *meridionator* Aubert, 1963	Ardahan, Erzurum, Kars	Kolarov & Çoruh, 2012; Çoruh et al, 2014b; Yaman, 2014
Genus *Ctenochira* Förster,1855		
Ctenochira sp.	Erzurum	Kolarov & Çalmaşur, 2011
Ctenochira angulata (Thomson, 1883)	Istanbul, Rize	Yurtcan & Beyarslan, 2002; Yaman, 2014; Kolarov et al, 2016
Ctenochira meridionator Aubert, 1969	Ordu	Çoruh et al, 2014a
Ctenochira pratensis (Gravenhorst, 1829)	Kars	Kolarov & Çoruh 2012; Yaman, 2014; Çoruh et al, 2014b
Genus *Erromenus* Holmgren,1857		
Erromenus bibulus Kasparyan, 1973	Bayburt	Çoruh et al, 2005; Çoruh et al, 2014b; Yaman, 2014
Erromenus brunicans Dalla Torre,1901	Isparta, Zonguldak	Gürbüz & Kolarov, 2006; Yurtcan et al, 2006; Yaman, 2014
Erromenus junior Thunberg, 1822	Erzurum	Çoruh et al, 2005; Yaman, 2014; Çoruh et al, 2014b
Erromenus melanonotus (Gravenhorst, 1829)	Kayseri	Kohl, 1905; Kolarov, 1995; Yaman, 2014
Erromenus punctulatus Holmgren, 1857	Erzurum	Kolarov & Çoruh 2012; Yaman, 2014; Çoruh et al, 2014b

Table 2. Continued.

Names of Taxa	Distributions in Turkey	References
TRIBE TRYPHONINI SHUCKARD, 1840		
Genus *Aderaeon* Townes & Townes, 1949		
Subgenus *Aderaeon* Townes & Townes, 1949		
Erromenus (Aderaeon) hamatus Kasparyan, 1971	Bayburt, Erzurum	Kolarov et al, 1999; Çoruh et al, 2014b
Genus *Dyspetes* Förster, 1868		
Dyspetes arrogator Heinrich, 1949	Kırklareli	Yurtcan & Beyarslan, 2002; Yaman, 2014
Genus *Monoblastus* Hartig, 1837		
Monoblastus brachyacanthus Gmelin, 1790	Ankara, Bayburt, Burdur, Edirne, Elazığ, Erzurum, Eskişehir, Kars, Kırklareli, Isparta, Sivas, Tekirdağ	Kolarov & Beyarslan, 1994; Yurtcan & Beyarslan, 2002; Çoruh et al, 2005, Gürbüz, 2005; Gürbüz & Kolarov, 2006; Beyarslan et al, 2006; Gürbüz et al, 2009b; Kolarov & Çoruh, 2012; Kolarov et al, 2014c; Çoruh et al, 2014b; Yaman, 2014; Özdan, 2014; Özdan & Gürbüz, 2016
Monoblastus discedens (Schmiedeknecht, 1912)	Isparta	Gürbüz & Kolarov, 2006; Gürbüz et al, 2009b, Yaman, 2014
Monoblastus fulvescens Fonscolombe, 1849	Edirne, Erzurum	Kolarov & Beyarslan, 1994, Çoruh et al, 2005; Çoruh et al, 2014b; Yaman, 2014
Monoblastus luteomarginatus (Gravenhorst, 1829)	Balıkesir, Kırklareli	Kolarov & Beyarslan, 1994; Yurtcan & Beyarslan, 2002
Monoblastus marginellus (Gravenhorst, 1829)	Afyon, Ankara, Antalya, Denizli, Erzurum, Isparta, Kırklareli, Muğla	Kolarov & Beyarslan, 1994; Yurtcan & Beyarslan, 2002; Yurtcan et al, 2006; Gürbüz & Kolarov, 2006; Gürbüz et al, 2009b; Kolarov & Çoruh, 2012; Çoruh et al, 2014b; Yaman, 2014
Genus *Neleges* Förster, 1868		
Neleges proditor (Gravenhorst, 1829)	Afyon, Edirne, Isparta, Istanbul, Malatya, Muğla, Uşak	Yurtcan & Beyarslan, 2002; Yurtcan et al, 2006; Gürbüz & Kolarov, 2006; Yaman, 2014
Genus *Otoblastus* Förster, 1869		
Otoblastus luteomarginatus (Gravenhorst, 1829)	Balıkesir, Elazığ, Erzurum, Isparta, Kırklareli, Malatya, Sivas	Kolarov & Beyarslan, 1994; Gürbüz & Kolarov, 2006; Gürbüz et al, 2009b; Kolarov & Çoruh, 2012; Çoruh et al, 2014b, Yaman, 2014
Genus *Parablastus* Constantineanu, 1973		
Parablastus anatolicus Gürbüz & Kolarov, 2005	Isparta	Gürbüz & Kolarov, 2005; Yaman, 2014
Parablastus ibericus Kasparyan, 1999	Isparta	Gürbüz & Kolarov, 2005; Gürbüz et al, 2009b; Yaman, 2014
Genus *Polyblastus* Hartig, 1837		
Subgenus *Labroctonus* Forster, 1869		
Polyblastus (Labroctonus) alternans Schiødte,1838	Aydın, Çanakkale, Denizli, Kırklareli	Kolarov et al, 1997; Yurtcan & Beyarslan, 2002; Yurtcan et al, 2006, Yaman, 2014
Subgenus *Polyblastus* Hartig, 1837		
Polyblastus (*Polyblastus*) *cothurnatus* Gravenhorst, 1829	Erzurum, Rize	Çoruh et al, 2005; Yaman, 2014; Çoruh et al, 2014b; Kolarov et al, 2016
Polyblastus (*Polyblastus*) *pinguis* (Gravenhorst, 1820)	Sivas	Yaman, 2014
Polyblastus (*Polyblastus*) *tuberculatus* Teunissen, 1953	Kayseri	Yaman, 2014
Polyblastus (*Polyblastus*) *varitarsus* (Gravenhorst, 1829)	Artvin, Erzurum	Kolarov & Çoruh 2012; Yaman, 2014; Çoruh et al, 2014b
Genus *Thibetoides* Davis,1897		
Thibetoides acerbus Victorov, 1964	Isparta, Elazığ	Gürbüz & Aksoylar, 2004; Gürbüz, 2005, Yaman, 2014
Tryphon (*Tryphon*) *relator* (Thunberg, 1822)	Edirne, Erzurum	Kolarov & Çoruh 2012; Yaman, 2014; Çoruh et al, 2014b
Tryphon (*Tryphon*) *rutilator* Linnaeus, 1761	Afyon, Ankara, Antalya, Artvin, Balıkesir, Bayburt, Bingöl, Çorum, Edirne, Erzincan, Erzurum, Eskişehir, Gümüşhane, Isparta, Istanbul, Kars, Kayseri, Kırklareli, Kırşehir, Konya, Malatya, Mersin, Niğde, Sivas, Rize, Yozgat	Fahringer, 1922; Kolarov & Beyarslan, 1994; Kolarov, 1995; Kolarov et al, 1999; Özdemir, 2001; Yurtcan & Beyarslan, 2002; Çoruh et al, 2005; Gürbüz & Kolarov, 2006; Gürbüz et al, 2009a, Gürbüz et al, 2009b; Özdemir & Güler, 2009; Kolarov & Çoruh 2012; Çoruh et al, 2014a; Yaman, 2014; Kolarov et al, 2016

Table 2. Continued.

Names of Taxa	Distributions in Turkey	References
TRIBE TRYPHONINI SHUCKARD, 1840		
Genus *Tryphon* Fallen, 1813		
Subgenus *Tryphon* Fallen, 1813		
Tryphon (*Tryphon*) *rutilator* Linnaeus, 1761	Afyon, Ankara, Antalya, Artvin, Balıkesir, Bayburt, Bingöl, Çorum, Edirne, Erzincan, Erzurum, Eskişehir, Gümüşhane, Isparta, Istanbul, Kars, Kayseri, Kırklareli, Kırşehir, Konya, Malatya, Mersin, Niğde, Sivas, Rize, Yozgat	Fahringer, 1922; Kolarov & Beyarslan, 1994; Kolarov, 1995; Kolarov et al, 1999; Özdemir, 2001; Yurtcan & Beyarslan, 2002; Çoruh et al, 2005; Gürbüz & Kolarov, 2006; Gürbüz et al, 2009a, Gürbüz et al, 2009b; Özdemir & Güler, 2009; Kolarov & Çoruh 2012; Çoruh et al, 2014a; Yaman, 2014; Kolarov et al, 2016
Tryphon (*Tryphon*) *signator* Gravenhorst, 1829	Aksaray, Ankara, Bayburt, Bingöl, Çorum, Edirne, Elazığ, Erzincan, Erzurum, Hatay, Isparta, Istanbul, Kars, Kastamonu, Kayseri, Kırklareli, Konya, Malatya, Muğla, Niğde, Samsun, Sivas, Sinop, Şanlıurfa, Uşak, Yozgat	Kolarov, 1987; Öncüer, 1991; Kolarov & Beyarslan, 1994; Kolarov et al, 1999; Yurtcan & Beyarslan, 2002, Gürbüz, 2005; Çoruh et al, 2005; Gürbüz & Kolarov, 2006; Yurtcan et al, 2006, Kolarov & Çoruh, 2012; Çoruh et al, 2014b; Birol, 2010, Gürbüz et al, 2009b, Yaman, 2014
Tryphon (*Tryphon*) *subsulcatus* (Holmgren, 1857)	Aksaray, Erzurum, Sivas	Çoruh et al, 2005, Yaman, 2014
Tryphon (*Tryphon*) *talitzkii* Telenga, 1930	Bayburt, Erzurum, Isparta, Kars	Çoruh et al, 2005; Kolarov & Çoruh, 2012; Çoruh et al, 2014b; Birol, 2010; Yaman, 2014
Tryphon (*Tryphon*) *thomsoni* Roman, 1939	Adıyaman, Afyon, Bayburt, Bingöl, Çankırı, Denizli, Diyarbakır, Edirne, Erzincan, Erzurum, Giresun, Gümüşhane, Isparta, Kahramanmaraş, Kars, Kayseri, Kırklareli, Malatya, Muğla, Sivas, Şanlıurfa, Uşak, Kırklareli	Kolarov & Beyarslan, 1994; Kolarov et al, 1999; Yurtcan & Beyarslan, 2002; Çoruh et al, 2005; Gürbüz & Kolarov, 2006; Yurtcan et al, 2006; Gürbüz et al, 2009a, Gürbüz et al, 2009b, Kolarov & Çoruh, 2012; Çoruh et al, 2014a, Çoruh et al, 2014b, Yaman, 2014; Kolarov et al, 2016
Tryphon (*Tryphon*) *trochanteratus* Holmgren, 1855	Ankara, Afyon, Denizli, Edirne, Elazığ, Istanbul, Izmir, Malatya, Muğla, Ordu.	Fahringer, 1922; Kolarov, 1987; Öncüer 1991; Yurtcan & Beyarslan, 2002; Yurtcan et al, 2006; Yaman, 2014
Tryphon (*Tryphon*) *zavreli* Gregor, 1939	Aksaray, Ankara, Bayburt, Diyarbakır, Edirne, Elazığ, Erzurum, Erzincan, Isparta, izmir, Kars, Konya, Malatya, Muğla, Sivas, Uşak, Yozgat	Kolarov, 1987; Öncüer, 1991; Kolarov & Beyarslan, 1994; Yurtcan & Beyarslan, 2002; Çoruh et al, 2005; Gürbüz & Kolarov, 2006; Yurtcan et al, 2006, Gürbüz et al, 2009a, Gürbüz et al, 2009b; Kolarov & Çoruh, 2012; Çoruh et al, 2014a, Çoruh et al, 2014b
Subgenus *Stenocrotaphon* Kasparyan, 1969		
Tryphon (*Stenocrotaphon*) *obtusator* (Thunberg, 1824)	Yozgat	Yaman, 2014; Çoruh et al, 2014b
Tryphon (*Stenocrotaphon*) *subsulcatus* Holmgren, 1857	Aksaray, Erzurum, Sivas	Çoruh et al, 2005
Subgenus *Symboethus* Foerster, 1869		
Tryphon (*Symboethus*) *heliophilus* Gravenhorst, 1829	Edirne	Yaman, 2014

According to their zoogeographical regions, the distributions of the species are as follows: 95 species have Western Palaearctic distribution, 91 species European, 84 species East Palaearctic, 13 species Oriental, 10 species Nearctic, 2 species Afrotropical, 2 species Oceanic, only one species Neotropical and Australian. In conclusion, Western Palaearctic and European ones have the highest numbers of species (Fig. 5). From the results of analyses of collected species, *Acrotomus succinctus*, *Oedemopsis scabricula*, *Netelia* (*Netelia*) *opacula* showed distribution in six different zoogeographical regions. *N.* (*N.*) *testacea* was found in each zoogeographical region. It is clearly understood that, this species was found in six geographical regions in Turkey, eight zoogeographical regions in the world. Moreover, *N. (N.) testacea* parasitizes noctuid moth caterpillars which come to lights and windows at night.

Showing all observations that they are tend toward to light. Many *Netelia* spp. have been caught in the light trap by us.

Evaluations of hosts and plants visited by adults

Subfamily Tryphoninae is important parasitoid group that uses Noctuidae as hosts. In this study, a total of 4 species were reared from different hosts in Turkey (Table 3). Most of these hosts belong to Lepidoptera order. Only one species was obtained from Hymenoptera species. According to these results, *Netelia* (*Netelia*) testacea and *Phytodietus polyzonias* were obtained from 3 different hosts. *N.* (*N.*) testacea has 62, *P.* polyzonias has 33 hosts in the world (Yu *et al*., 2012). *Exenterus abruptorius* and *N. (B.) virgata* were obtained from one host. Plant–insect relationships have great importance to ecosystem (Petanidou & Lamborn, 2005). In recent years studies have found many species in our country. Table 4 showed the tryphonine species associated with the plant species in Turkey. Until now, 9 species have been identified as plants visitors by tryphonine adults. At the end of the study, the followings were observed:Turkey has an important topographic and climatic structure with its position at the junction of Asia, Africa and Europe. Therefore, every year several species have been added to the Ichneumonidae fauna of Turkey. In this regard, the taxonomical and biogeographical charecteristics of the species in Turkey should be idendified and monitored. In recent years, biogeographical studies have been done on this family.Until know, 1257 species were recognized in the last 20 years. We believe that there are many species that are not determined in our country.

Table 3. Parasitoid tryphonines obtained from different hosts in Turkey.

Names of Taxa	Hosts Name	Order and Family of Hosts	References
Exenterus abruptorius	*Diprion pini* L.	Hymenoptera: Diprionidae	Özdemir, 2001
Netelia (Bessobates) virgata	*Cosmia trapezina* (L.)	Lepidoptera: Noctuidae	Okyar & Yurtcan, 2007
Netelia (*Netelia*) testacea	*Polygonia egea* (Cramer)	Lepidoptera:Nymphalidae	Kolarov, 1995
	Acronista rumicis L.	Lepidoptera: Noctuidae	
	Pectinophora gossypiella Saunders	Lepidoptera: Gelechiidae	
Phytodietus polyzonias	*Archips xylosteana* (L.)	Lepidoptera: Tortricidae	Özdemir, 2001
	Archips sp.	Lepidoptera: Tortricidae	
	Yponomeutidae malinellus Zeller	Lepidoptera: Yponomeutidae	

Table 4. Plants visited by tryponine adults in Turkey.

Names of Taxa	Plant Species	Family of Plant Species	Reference
Exenterus abruptorius	*Pinus* sp.	Pinaceae	Özdemir, 2001
Netelia (*Bessobates*) *latungula*	*Achillea micrantha* M. & B.	Asteraceae	Fahringer, 1922
Netelia (*Bessobates*) *virgata*	*Hypericum rhodopaeum* Friv.	Clusiaceae	Fahringer, 1922
Netelia (Netelia) *dilatata*	*Medicago sativa* L.	Fabaceae	Kolarov et al, 1999
Netelia (*Paropheltes*) *parvula*	*Peganum harmala* L.	Zygophyllaceae	Özdemir, 2001
Netelia (*Paropheltes*) *terebrator*	*Medicago sativa* L.	Fabaceae	Özdemir, 2001
Cosmoconus (*C.*) *elongator*	*Chrysanthemum argentatum* Willd.	Asteraceae	Kolarov, 1995
Tryphon (*Tryphon*) *rutilator*	*Daucus carota* L.	Apiaceae	Fahringer, 1922
Phytodietus polyzonias	*Prunus avium* L.	Rosaceae	Özdemir, 2001
	Juglans regia L.	Junglandaceae	
	Malus domestica Borkh.	Rosaceae	
	Prunus armeniaca L.	Rosaceae	
	Prunus domestica L.	Rosaceae	

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