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Original article (Orijinal araştırma)

Taxonomic and biogeographic evaluations of the subfamily Cryptinae (Hymenoptera: Ichneumonidae)

Türkiye Cryptinae (Hymenopera: Ichneumonidae) altfamilyası üzerinde taksonomik ve biocoğrafik değerlendirmeler

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Abstract

The taxonomic and biogeographic data of specimens belonging to the subfamily Cyrptinae (Hymenoptera: Ichneumonidae) collected from different regions in Turkey between 1990 and 2018 were studied. An additional 13 samples collected before 1990 were also included. Three tribes, 61 genera and 187 species were identified. Most of samples were collected during last 25 years or recorded in this time from seven different regions of Turkey by researchers. Among the species listed, *Agrothereutes tiloidalis* Kolarov & Beyaslan, 1994, *Stilpnus adanaensis* Kolarov & Beyaslan, 1994 and *Aptesis cavigena* Kolarov & Gürbüz, 2009 were described from Turkey. Also, these species are endemic to Anatolia. Detailed composition, biogeographic and zoogeographic data, vertical distribution, seasonal dynamics, individual diversity, available host data and plants visited by adults are given.

Keywords: Cryptinae, Hymenoptera, Ichneumonidae, Turkey

Öz

Türkiye'nin farklı bölgelerinden 1990 ve 2018 yılları arasında toplanan Cyrptinae (Hymenoptera: Ichneumonidae) altfamilyasına ait türleri içeren bu çalışma, taksonomik ve biocoğrafik değerlendirmeleri amaçlamıştır. Buna ek olarak 1990 yılından önce toplanmış olan 13 türü de içermektedir. Sonuçlar değerlendirdiğinde, üç tribus ve 61 cinse bağlı 187 tür teşhis edilmiştir. Türlerin çoğu son 25 yıl süresince toplanmış, *Agrothereutes tiloidalis* Kolarov & Beyaslan, *Stilpnus adanaensis* Kolarov & Beyaslan ve *Aptesis cavigena* Kolarov & Gürbüz türleri ilk kez ülkemizden bilim dünyasına kazandırılmıştır. Bu türler endemic durumdadır. Çalışmada her bir tür için tür kompozisyonu, biocoğrafik ve zoocoğrafik veriler, dikey dağılımlar, sezonal aktiviteler, konukçu ve ziyaret edilen bitkiler de verilmiştir.

Anahtar sözcükler: Cryptinae, Hymenoptera, Ichneumonidae, Türkiye

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Introduction

The order Hymenoptera includes well-known species, including bees, sawflies, wasps and ants, which are among the most common animals on earth. The order contains about 8% of all described species (Davis et al., 2010). Parasitic Hymenoptera have often been used for biological control and these programs demonstrate the great impact that they can have on host populations (Sharkey, 2007).

The Ichneumonidae Latreille, 1802 includes 45 subfamilies, 1601 genera and 25,285 described species (Yu et al., 2016). According to recent studies, number of Ichneumonidae of Turkey is 1257 species in 287 genera (Sarı & Çoruh, 2018).

The subfamily Cryptinae (Figure 1) is the largest subfamily of Ichneumonidae and can be encountered in virtually all terrestrial habitats. The nomenclature of this group is complex, also using the names Phygadeuontinae and Gelinae (Townes, 1969). The most common feature to distinguish a cryptine is the sternaulus. The second recurrent vein is always present in almost all species. First abdominal segment slender, or sometime of moderates proportion. Glymma always lacking (Azura & Idris, 2002).

Figure 1. Cryptinae species: a) *Meringopus calescens* (Gravenhorst, 1829) (from Rudow, 1886); b) *Acroricnus seductor* (Scopoli, 1786) (from Tixier-Inrep, 2015).

Almost all Cryptinae have been described as idiobiont ectoparasitoids. The most common hosts of Cryptinae are endopterygote pupae or prepupae enclosed in cocoons or plant tissue. There are also some endoparasitic species in the Hedycryptina, Phygadeuontina and Stilpnina. A few species are koinobionts. Furthermore, some species parasitize the egg sacs of Pseudoscorpionida and Araneae and many can develop as secondary parasitoids (Goulet & Huber, 1993). Although there is considerable information on the host relationships of some Cryptinae, virtually nothing is known of their biology. Furthermore, as a consequence of the large size of this subfamily, it is structurally very diverse (Gauld & Gaston, 1995).

Lately, Santos (2017) restricted Cryptinae to the tribes Aptesini and Cryptini and elevated the Phygadeuontini and Ateleutina to subfamily status.

Worldwide the subfamily comprises about 403 genera and 5,080 species (Yu et al., 2016). In this case, Cryptinae has the most species in the Ichneumonidae. The catalog of Ichneumonidae of Turkey (Kolarov, 1995) listed 66 Cryptinae species. Since 1995, the number of cryptine fauna of Turkey has reached 187 species (Kolarov et al., 1997a, b; Jussila, 2001; Kolarov et al., 2002; Schwarz, 2005, 2007; Çoruh & Özbek, 2005; Kolarov & Bordera, 2007; Kolarov & Gürbüz, 2007; Kırtay, 2008; Çoruh & Çoruh, 2008; Çoruh & Kesdek, 2008, Gürbüz & Kolarov, 2008; Kolarov & Yurtcan, 2008; Kolarov & Gürbüz, 2009; Özdemir & Güler, 2009; Gürbüz et al., 2009a, b; Quicke et al., 2009; Çoruh & Özbek, 2011; Eroğlu et al., 2011; Çoruh & Çoruh, 2012; Özdan, 2014; Çoruh et al., 2014a, b; Kolarov et al., 2014, Çoruh & Çalmaşur, 2016; Çoruh & Kolarov, 2016; Özdan & Gürbüz, 2016; Çoruh et al., 2016; Kolarov et al., 2016; Sarı & Çoruh, 2018; Çoruh et al., 2018).

The present study aimed to provide detailed information on the subfamily Cryptinae species in Turkey.

Materials and Methods

Samples were collected from 48 of the 81 provinces of Turkey in seven regions (Figure 2) of Anatolia. Adults were collected with an entomological sweep net (40 cm in diameter), aspirator, malaise and light trap. They were preserved in 75% alcohol in insect envelopes in the field and then pinned before drying. Some of the samples are also reared from host insects under laboratory conditions.

Plants visited by insects were also identified, pressed and stored in recent studies.

Fauna lists usually contain localities, altitude, collecting date, number and sex of each specimen examined. Information on world distribution for each species listed is based on Yu et al. (2016).

Figure 2. The geograprahical region of cryptine collected.

Results and Discussion

A total of 187 species belonging to subfamily Cryptinae are discussed with different evaluations.

Faunistic evaluations

A total of 187 species in 61 genera in three tribes of Cryptinae have been recorded in Turkey (Table 1). The total number of samples was 1485. However, the number of samples for 31 species is unclear.

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

Names of Taxa	IN ♂	IN ♀	VD (m.)	SD	GR	ZR	HR	PVR	FRT
TRIBE CRYPTINI KIRBY, 1837									
Genus *Acroricnus* Ratzeburg, 1852									
Acroricnus seductor (Scopoli, 1786)		1	F	Jul	EAR, MtR	E, EP, WP			Fahringer & Friese, 1921
Acroricnus seductor elegans Mocsary, 1883		1	F	Jul	EAR	E, WP			Çoruh & Özbek, 2011
Acroricnus seductor syriacus (Mocsary, 1883)		1	D	Jul	MtR	E, WP			Gürbüz & Kolarov, 2008
Acroricnus stylator (Thunberg, 1822)	2	3	A,E	Jul&Aug	MR, EAR	E, EP, NEAR, WP			Kolarov, 1987
Genus *Agrothereutes* Förster, 1850									
Agrothereutes abbreviator (Fabricius, 1793)	1	2	B,H,F	Jul,Sep	BSR, EAR, MtR	E, WP		X	Fahringer, 1921
Agrothereutes bombycis (Boudier, 1836)	2		A	Apr	MR	E, WP			Beyarslan & Kolarov, 1994
Agrothereutes fumipennis (Gravenhorst, 1829)	4	6	C,D,F,H	Ap-May-Jun,Jul-Aug-Sep	BSR, EAR, MtR	E, EP, WP		X	Çoruh & Özbek, 2005
Agrothereutes grossus (Gravenhorst, 1829)	3		A	Jun	MR	E, WP			Beyarslan & Kolarov, 1994
Agrothereutes hospes (Tschek, 1871)	2	2	A,C,D,F	Jun-Jul&Oct	BSR, EAR, MtR	E, EP, WP	X		Beyarslan & Kolarov, 1994
Agrothereutes leucorhaeus (Donovan, 1810)	?	?	?	?	?	E, WP			Kolarov & Bordera, 2007

Table 1. Continued

Names of Taxa	IN ♂	IN ♀	VD (m.)	SD	GR	ZR	HR	PVR	FRT
Agrothereutes parvulus (Habermehl, 1926)	3		A,D	Jun	BSR, MtR	E, EP, WP			Gürbüz & Kolarov, 2008
Agrothereutes tiloidalis Kolarov & Beyarslan, 1994	1	2	A	Apr,Aug	MR, MtR	WP			Kolarov & Beyarslan, 1994
Genus *Aritranis* Förster, 1869									
Aritranis buccatus (Tschek, 1872)	?	?	A	Aug	MtR	E, WP			Sedivy, 1959
Aritranis claviventris (Kriechbaumer, 1894)	1	1	D	May	MtR	E, EP, WP			Beyarslan & Kolarov, 1994
Aritranis coxator Tsckek, 1871		1	A	Aug	MR	E, EP, WP			Kolarov et al., 1997a
Aritranis director (Thunberg, 1822)	71	6	C,D,E,F	May-Jun-Jul	BSR, EAR, MtR	E, EP, NEAR, WP			Gürbüz & Kolarov, 2008
Aritranis femoralis Gravenhorst, 1829	1	2	A	May	EAR, MR	E, EP, WP		X	Beyarslan & Kolarov, 1994
Aritranis graefei Thomson, 1896	?	?	A	?	AR	E, WP	X	X	Öncüer, 1991
Aritranis heliophilus (Tschek, 1871)	2	2	A	Jun-Jul-Aug-Sep	MR, MtR	E, EP, WP			Beyarslan & Kolarov, 1994
Aritranis longicauda (Kriechbaumer, 1873)	34	11	C,D,E	Apr-May-Jun	MtR	E, WP			Gürbüz & Kolarov, 2008
Aritranis nigrifemur (Szepligeti, 1916)	2	2	D,E	Jun-Jul	Anatolia, MtR	E, EP, WP			Sedivy, 1959
Aritranis nigripes (Gravenhorst, 1829)	?	?	B	Aug	MtR	E, EP, WP			Sedivy, 1959
Aritranis occisor (Gravenhost, 1829)	1		C	Jun	Anatolia, MtR	E, EP, WP			Schwarz, 2005
Aritranis quadriguttata (Gravenhorst, 1829)	1		B	Aug	MR	E, EP, WP			Kolarov et al., 1997a
Aritranis signatoria Fabricius, 1793	1	1	A	Aug	MR	E, WP			Kolarov et al., 1997a
Genus *Buathra* Cameron, 1903									
Buathra laborator (Thunberg, 1824)	9	11	D,G,H	May-Jun&Aug	BSR, EAR, MtR	E, EP, NEAR, WP	X	X	Gürbüz & Kolarov, 2008
Buathra tarsoleucos (Schrank, 1781)	2	3	D,G	May&Jul&Aug	EAR, MR,MtR	E, EP, WP			Fahringer, 1922
Genus *Caenocryptus* Thomson, 1873									
Caenocryptus rufiventris (Gravenhorst, 1829)	?	?	A	Jun	MR	E, EP, WP			Sedivy, 1959
Genus *Cryptus* Fabricius, 1804									
Cryptus armator Fabricius, 1804	?	?	D	Jul	Anatolia	E, EP, WP		X	Fahringer, 1922
Cryptus dianae Gravenhorst, 1829		3	D	May-Jun-Jul	MtR	E, EP, WP			Gürbüz & Kolarov, 2008
Cryptus leucocheir (Ratzeburg, 1844)	?	?	D	?	CAR	E, EP, WP			Kolarov, 1995
Cryptus minator Gravenhorst, 1829	?	?	C	?	AR	E, WP	X		Kolarov, 1987
Cryptus moschator (Fabricius, 1787)	1		C	May	EAR	E, NEAR, WP			Kolarov et al., 2014a
Cryptus spinosus Gravenhorst, 1829	3	1	D	Jun&Aug	MtR	E, EP, WP			Sedivy, 1959
Cryptus spiralis (Geoffroy, 1785)	10	12	E,F,H	May-Jun-Jul&Sep	CAR, EAR, MtR	E, EP, WP		X	Çoruh & Özbek, 2005
Cryptus subspinosus Smith van Burgst, 1913		1	D	May	Anatolia, MtR	E, EP, WP			Schwarz, 2005
Cryptus triguttatus Gravenhorst, 1829	4	4	A,D	May-Jun-Jul-Aug	AR; MR	E, EP, WP			Beyarslan & Kolarov, 1994
Cryptus tuberculatus Gravenhorst, 1829	1	2	B,E	May-Jun-Jul	MtR, MR	E, EP, WP			Sedivy, 1959
Cryptus viduatorius Fabricius, 1804	76	30	A,E,F,G	Apr-May-Jun-Jul-Aug	EAR, BSR, MtR, MR	E, EP, WP		X	Kolarov, 1987
Genus *Enclisis* Townes, 1970									
Enclisis omaticeps (Thomson, 1885)	?	?	?	?	Anatolia	E, WP			Schwarz, 1989
Genus *Gambrus* Förster, 1869									
Gambrus carnifex (Gravenhorst, 1829)	1	7	A,C,D	Mar&Jun-Jul	MtR	E, EP, WP			Beyarslan & Kolarov, 1994
Gambrus incubitor (Linnaeus, 1758)	3	1	A,D,E	Mar&May-Jun	BSR, MtR	AFR, E, EP, WP			Beyarslan & Kolarov, 1994
Gambrus inferus Thomson, 1896	1	5	A	Apr&Aug	MtR, MR	E, WP			Kolarov, 1987
Gambrus opacus Szepligeti, 1916		4	G,H	Jun-Jul	EAR	E, WP	X		Çoruh & Özbek, 2005
Gambrus ornatulus (Thomson, 1873)	3		A	Sep	MtR	E, EP, WP			Kolarov et al., 1997a
Gambrus tricolor (Gravenhorst, 1829)		2	B,D	Jun&Sep	BSR	E, WP			Kolarov & Yurtcan, 2008

Table 1. Continued

Names of Taxa	IN ♂	IN ♀	VD (m.)	SD	GR	ZR	HR	PVR	FRT
Genus *Hidryta* Förster, 1869									
Hidryta frater (Cresson, 1864)	1		A	Sep	MR	E, NEAR, WP			Kolarov et al., 1997a
Hidryta sordida (Tschek, 1871)	3		D	May	MtR	E, EP, WP			Gürbüz & Kolarov, 2008
Genus *Hoplocryptus* Thomson,1873									
Hoplocryptus confector (Gravenhorst, 1829)	1		D	Jun	Anatolia, MtR	E, EP, WP			Schwarz, 2007
Hoplocryptus femoralis (Gravenhorst, 1829)	8	6	D,E,F	May-Jun&Aug	Anatolia, BSR, EAR	E, EP, WP			Schwarz, 2007
Hoplocryptus fugitivus (Gravenhorst, 1829)	1	6	F,G	Jun	EAR, MtR	E, WP			Çoruh & Özbek, 2005
Hoplocryptus murarius (Börner, 1782)	2		A,B	Jun	Anatolia, BSR	E, EP, WP			Schwarz, 2007
Hoplocryptus odoriferator (Dufour & Perris, 1840)	1		E	May	MtR	E, WP			Schwarz, 2007
Hoplocryptus quadriguttatus (Gravenhorst, 1829)	2		E	Jun	MtR	E, EP, WP			Schwarz, 2007
Genus *Idiolispa* Förster, 1869									
Idiolispa analis (Gravenhorst, 1807)	11		B,C,D,F	May&Jul	EAR, MtR, SAR	E, EP, NEAR, ORR, WP			Beyarslan & Kolarov, 1994
Genus *Ischnus* Gravenhorst, 1829									
Ischnus agitator (Oliver, 1792)	5	6	A,C,D,G	May-Jun-Jul-Aug	AR, EAR, MtR	E, EP, WP		X	Gürbüz & Kolarov, 2008
Ischnus alternator Gravenhorst, 1829	2	3	A,D	Jun&Aug	BSR, MR	E, EP, WP			Kolarov et al., 1997a
Ischnus inquisitorius (Müller, 1776)	2		E	Aug-Sep	BSR, EAR	E, EP, NEAR, NTR, WP			Kolarov & Yurtcan, 2008
Ischnus migrator (Fabricius, 1775)	4		B,E	Jun- ul	MtR	E, EP, WP		X	Fahringer, 1922
Ischnus minutorius (Fabricius, 1804)		7	A	May-Jun	MtR	E, WP			Beyarslan & Kolarov, 1994
Genus *Latibulus* Gistel, 1848									
Latibulus argiolus (Rossi, 1790)	1	2	B,E	May-Jun-Jul-Aug	CAR, EAR	E, EP, WP		X	Fahringer, 1922
Genus *Listrocryptus* Brauns, 1905									
Listrocryptus spatulatus Brauns, 1905	1		A	Jun	MtR	E, WP			Beyarslan & Kolarov, 1994
Genus *Listrognathus* Tschek 1871									
Listrognathus (*Listrognathus*) *furax* (Tschek, 1871)	4		D	May	MtR	E, EP, WP			Gürbüz & Kolarov, 2008
Listrognathus ligator Gravenhorst 1829	?	?	?	?	Anatolia	E, WP			Horstmann, 1990
Listrognathus obnoxius (Gravenhorst, 1829)	4		A	May	MR	E, WP			Beyarslan & Kolarov, 1994
Genus *Meringopus* Förster, 1869									
Meringopus calescens (Gravenhorst, 1829)	73	226	D,G,H	Jul	AR, EAR	E, EP, NEAR, ORR, WP		X	Beyarslan & Kolarov, 1994
Meringopus calescens calescens (Gravenhorst, 1829)	3		H	Jun	EAR	E, EP, NEAR, ORR, WP		X	Kolarov et al., 2016
Meringopus calescens persicus Heinrich, 1937	4	1	D,H	Jun-Jul	EAR	WP			Kolarov & Yurtcan, 2008
Meringopus cyanator (Gravenhorst, 1829)	21	30	G,H	Jun-Jul	EAR	E, EP, WP	X	X	Çoruh & Özbek 2005
Meringopus nigerrimus (Fonscolombe, 1850)		1	G	Jul	EAR	E, EP, NEAR, WP			Çoruh & Özbek 2005
Meringopus pseudonymus (Tschek, 1872)		6	C,D	May-Jun&Aug	EAR, MR, MtR	E, EP, WP		X	Kolarov, 1987
Meringopus titillator (Linnaeus, 1758)	24	2	E,F,G,H	May-Jun-Jul&Aug	CAR, EAR, MtR	E, EP, WP		X	Szepligeti, 1916
Meringopus titillator rhodius (Dalla Torre, 1902)	2	4	D,H	Sep	EAR, MtR	E, EP, WP		X	Gürbüz & Kolarov, 2008
Genus *Mesostenus* Gravenhorst, 1829									
Mesostenus albinotatus Gravenhorst, 1829	11	14	B,E,F,H	Jun-Jul-Aug	BSR, EAR MtR	E, EP, NEAR, WP		X	Sedivy, 1959
Mesostenus grammicus (Gravenhorst, 1829)	3	7	A,D,E	Jun-Jul&Sep	EAR, MR, MtR	E, EP, WP			Kolarov, 1987
Mesostenus transfuga Gravenhorst, 1829	13	11	A,E,F,H	May-Jun-Jul-Aug	AR, MR, MtR, EAR	E, EP, OCC, WP	X	X	Beyarslan & Kolarov, 1994
Genus *Myrmeleonostenus* Uchida 1936									
Myrmeleonostenus italicus (Gravenhorst, 1829)	4	14	A,C,D,F	May-Jun-Jul	BSR, EAR, MR, MtR	E, EP, WP		X	van Rossem, 1969

Table 1. Continued

Names of Taxa	IN ♂	IN ♀	VD (m.)	SD	GR	ZR	HR	PVR	FRT
Genus *Nematopodius* Gravenhorst, 1829									
Nematopodius formosus Gravenhorst, 1829		1	D	Jul	BSR	E, WP			Çoruh et al., 2016
Genus *Polytribax* Förster, 1869									
Polytribax perspicillator (Gravenhorst, 1807)	7	2	A	May&Aug	MtR	E, EP, WP			Beyarslan & Kolarov, 1994
Genus *Pycnocryptus* Thomson, 1873									
Pycnocryptus claviventris Krichbaumer, 1894		1	D	Jun	MtR, SAR	E, EP, WP			Beyarslan & Kolarov, 1994
Pycnocryptus director (Thunberg, 1822)	5	3	A,D	May-Jun-Jul	MtR, MR	E, EP, NEAR, WP			Beyarslan & Kolarov, 1994
Pycnocryptus rarus (Hebermehl, 1920)	?	?	A	Jun	BSR	E, WP			Sedivy, 1959
Genus *Pycnocryptodes* Aubert, 1971									
Pycnocryptodes reticulator Aubert, 1971		1	C	Jul	MtR	EP, WP			Gürbüz & Kolarov, 2008
Genus *Schreineria* Schreiner, 1905									
Schreineria populnea (Giraud, 1872)		2	A,D	Jul	BSR	E, EP, WP			Çoruh et al., 2014a
Genus *Stenarella* Szépligeti,1916									
Stenarella domator (Pado, 1761)	1	3	D	May&Jul	MR, MtR	E, EP, WP		X	Fahringer, 1922
Genus *Synechocryptus* Schmiedechnect, 1904									
Synechocryptus mactator (Tschek, 1870)		3	C	May	AR, MtR	E, EP, WP			Kolarov, 1987
Genus *Thrybius* Townes, 1965									
Thrybius praedator (Rossi, 1792)	?	?	A	Jul	MtR	E, EP, WP			Fahringer, 1922
Genus *Trychosis* Förster 1869									
Trychosis atripes (Gravenhorst, 1829)		2	A,D	Jun-Jul	MR, MtR	E, EP, WP			Beyarslan & Kolarov, 1994
Trychosis legator (Thunberg, 1822)	28	12	A,B,C,D	Apr-May-Jun-Jul-Aug	BSR, EAR, MtR, MR, SAR	E, EP, WP			Kolarov, 1987
Trychosis neglecta (Tschek, 1870)		3	D,E	Jun & Aug	MR, MtR	E, EP, WP		X	Fahringer, 1922
Trychosis mesocastana (Tschek, 1871)	1		A	Jul	MtR	E, WP			Kolarov et al., 1997b
Trychosis pauper (Tschek, 1871)	13	2	D	May-Jun-Jul-Aug	EAR, MtR MR,	E, EP, WP			Kolarov et al., 1997b
Trychosis priesneri Rossem, 1971	1	1	D,E	M	CAR, MtR	E, EP, WP			van Rossem, 1971
Trychosis timenda Rossem, 1990	8		A	May&Aug	MtR, MR	E, WP			Beyarslan & Kolarov, 1994
Trychosis tristator (Tschek, 1871)	8	8	A,C	May-Jun-Jul-Aug	EAR, MtR, MR	E, EP, WP			Beyarslan & Kolarov, 1994
Genus *Xylophrurus* Förster, 1869									
Xylophrurus augustus (Dalman, 1823)	1	9	C,E	Apr-May-Jun	AR, CAR, EAR, MtR	E, WP			Özdemir & Güler, 2009
Xylophrurus lancifer (Gravenhorst, 1829)	1		G	Jun	EAR	E, EP, WP			Kolarov et al., 2016
TRIBE HEMIGASTERINI ASHMEAD, 1900									
Genus *Aptesis* Förster, 1850									
Aptesis assimilis (Gravenhorst, 1829)	7	2	E,H	Jun-Jul	EAR	E, WP			Kolarov et al., 2016
Aptesis cavigena Kolarov & Gürbüz, 2009	1		E	Jun	MtR	WP			Kolarov & Gürbüz, 2009
Aptesis cretata (Gravenhorst, 1829)	1		B	Aug	MtR	E, WP			Kolarov et al., 1997a
Aptesis nigrocincta (Gravenhorst, 1815)	1		D	Jul	EAR	E, EP, WP			Kolarov et al., 2014a
Aptesis senicula (Kriechbaumer, 1893)	5	1	C,D,E,F	May	BSR, EAR, MtR	E, WP			Beyarslan & Kolarov, 1994
Genus *Giraudia* Foerster, 1869									
Giraudia gyratoria (Thunberg, 1824)	?	?	B	Aug	MtR	E, EP, WP		X	Fahringer, 1922

Table 1. Continued

Names of Taxa	IN ♂	IN ♀	VD (m.)	SD	GR	ZR	HR	PVR	FRT
Genus *Parmortha* Townes, 1962									
Parmortha pleuralis (Thomson, 1873)	2		A	Aug	MtR	E, EP, NEAR, WP			Kolarov et al., 1997a
Pleolophus brachypterus (Gravenhorst, 1815)	1		E	Jul-Aug	EAR, MtR	E, EP, WP		X	Fahringer, 1922
Genus *Polytribax* Förster, 1869									
Polytribax rufipes (Gravenhorst, 1829)	?	?	C	Jul-Aug	AR	E, WP		X	Fahringer, 1921
TRIBE PHYGADEUONTINI FORSTER, 1869									
Genus *Aclastus* Förster, 1869									
Aclastus gracilis (Thomson, 1884)	21	3	D,E	May-Jun-Jul&Sep	MR, MtR	E, EP, NEAR, WP			Kolarov et al., 1997b
Aclastus micator (Gravenhorst, 1807)	19	5	A,D	May-Jun-Jul&Sep	AR, MtR	E, EP, NEAR, WP			Beyarslan & Kolarov, 1994
Aclastus solutus (Thomson, 1984)	3	3	A,D	May-Jun-Jul	AR, MtR	E, EP, WP			Beyarslan & Kolarov, 1994
Aclastus transversalis Horstman, 1980	1		D	May	MtR	E, WP			Kolarov & Gürbüz, 2007
Genus *Acrolyta* Förster, 1869									
Acrolyta distincta (Bridgman, 1883)	1	3	A	Aug	MR	E, WP			Kolarov et al., 1997a
Acrolyta semistrigosa (Schmiedeknecht, 1897)	1		D	Jun	MtR	E, WP			Kolarov & Gürbüz, 2007
Genus *Atractodes* Gravenhorst, 1829									
Subgenus *Atractodes* (*Asyncrita*) Förster, 1876									
Atractodes (*Asyncrita*) *assimilis* Förster, 1876	2		D,F	May&Sep	MtR, SAR	E, WP			Beyarslan & Kolarov, 1994
Atractodes (Asyncrita) foveolatus (Gravenhorst, 1829)		1	H	Aug	BSR	EP, E, WP			Beyarslan & Kolarov, 1994
Subgenus *Atractodes* (*Atractodes*) Gravenhorst, 1829									
Atractodes (*Atractodes*) *fumatus* Haliday, 1838		1	D	Jul	MtR	EP, E, NEAR, WP			Beyarslan & Kolarov, 1994
Atractodes (Atractodes) pusillus Förster, 1876		1	E	Oct	MtR	EP, E, NEAR, WP			Beyarslan & Kolarov, 1994
Genus *Bathythrix* Förster, 1869									
Bathythrix claviger (Taschenberg, 1865)	?	?	A	May	MR	EP, E, NEAR, ORR WP	X		Schimitschek, 1944
Bathythrix collaris (Thomson, 1896)	4		D	Jul	BSR	E, WP			Çoruh et al., 2016
Bathythrix decipiens (Gravenhorst, 1829)	2		D	May&Sep	BSR, MtR	E, WP			Kolarov & Gürbüz, 2007
Bathythrix fragilis (Gravenhorst, 1829)		1	A	Jul	BSR	E, WP			Çoruh et al., 2016
Bathythrix lamina (Thomson 1884)	5	5	A,C,F	Jun-Jul&Sep	BSR, MR, MtR	E, WP			Kolarov et al., 1997a
Bathythrix linearis (Gravenhorst, 1829)	1		B	Jun	BSR	EP, E, WP			Çoruh et al., 2014a
Bathythrix pellucidator (Gravenhorst, 1829)	4		A	Jun	BSR	EP, E, WP			Çoruh et al., 2014a
Genus *Blapsidotes* Förster, 1869									
Blapsidotes vicinus (Gravenhorst 1829)	10	1	C,D	May-Jun-Jul&Sep	BSR, MtR	EP, E, WP			Kolarov & Gürbüz, 2007
Genus *Ceratophygadeuon* Viereck, 1924									
Ceratophygadeuon anurus (Thomson, 1884)	?	?	F	Aug	EAR	E, WP			Horstmann, 1993
Genus *Chirotica* Förster, 1869									
Chirotica decorator (Villers, 1789)	?	?	A	Jun	MtR	EP, E, WP			Kolarov, 1987
Chirotica insignis (Gravenhorst 1829)		1	E	Aug	EAR	E, WP			Çoruh & Kolarov, 2016
Chirotica orientalis Horstmann, 1983		1	B	Apr	SAR	WP	X		Kolarov & Erkin, 1987
Chirotica ruficeps Horstmann, 1983	?	?	H	Aug	EAR	E, WP			Horstmann, 1993
Chirotica terebrator Horstmann, 1983	1		B	May	SAR	EP, E, WP	X	X	Horstmann, 1993
Genus *Diaglyptellana* Horstmann, 1976									
Diaglyptellana punctatus (Holmgren, 1857)	?	?	C	Jul	CAR	E, WP			Sedivy, 1959

Table 1. Continued

Names of Taxa	IN ♂	IN ♀	VD (m.)	SD	GR	ZR	HR	PVR	FRT
Genus *Diaglyptellodes* Aubert, 1993									
Diaglyptellodes sculpturator (Aubert, 1977)	1		D	May	Anatolia, MtR	EP, E, WP			Aubert, 1977
Genus *Dichrogaster* Doumerc, 1855									
Dichrogaster aestivalis (Gravenhorst, 1829)	36	13	A,B,D,F	May-Jun-Jul	CAR, EAR, MtR, MR, SAR	EP, E, WP			Beyarslan & Kolarov, 1994
Dichrogaster diatropus Townes, 1983	1	1	A	May&Sep	CAR, MtR	E, NEAR, WP			Townes, 1983
Dichrogaster liostylus Thomson, 1885	3		B	Jun	BSR	EP, E, ORR, WP		X	Kolarov, 1995
Dichrogaster longicaudata (Thomson 1885)	21	1	D,E,G	May-Jul	EAR, CAR, MtR	EP, E, NEAR WP		X	Townes, 1983
Dichrogaster modesta (Gravenhorst, 1829)	6		E,F	Sep	BSR, MtR	E, WP		X	Kolarov et al., 1997a
Dichrogaster perlae (Dounmerc, 1855)	1		D	Jun	MtR	E, WP			Kolarov & Gürbüz, 2007
Dichrogaster saharator (Aubert, 1964)		2	D	May	MR, MtR	EP, E, WP			Kolarov et al., 1997b
Dichrogaster schimitscheki (Fahringer, 1935)	8	3	D,E	May-Jun	MtR	E, NEAR, WP			Kolarov & Gürbüz, 2007
Genus *Echthrus* Gravenhorst, 1829									
Echthrus reluctator (Linnaeus, 1758)	?	?	A	Aug	MtR	EP, E, WP	X	X	Fahringer, 1922
Genus *Encrateola* Strand, 1917									
Encrateola laevigata (Ratzeburg, 1848)		2	A,G	Jun-Jul	BSR, EAR, MtR	AFR, EP, E, NEAR, WP		X	Beyarslan & Kolarov, 1994
Genus *Endasys* Förster, 1869									
Endasys brevis (Gravenhorst, 1829)	2		D,E	May	Anatolia, MtR	EP, E, WP			Sawoniewicz, & Luhman, 1992
Endasys erythrogaster (Gravenhorst, 1829)	?	?	C	May	CAR	EP, E, WP	X		Kolarov, 1987
Endasys femoralis (Habermehl 1912)	1		D	Jul	MtR	E, WP			Kolarov & Gürbüz, 2007
Endasys minutulus (Thomson 1883)	8		E	Jun	MtR	E, NEAR, WP			Kolarov & Gürbüz, 2007
Endasys parviventris (Gravenhorst, 1929)	?	?	?	?	Anatolia	EP, E, ORR, WP			Sawoniewicz, & Luhman, 1992
Endasys plagiator (Gravenhorst ,1829)	5		E,G,H	Jun	Anatolia, EAR, MtR	E, WP			Sawoniewicz, & Luhman, 1992
Endasys rubricator (Thunberg, 1822)	?	?	D	May	CAR	E, WP			Kolarov, 1987
Endasys senilis (Gmelin, 1790)	1		D	Jun	MtR	E, WP			Kolarov & Gürbüz, 2007
Genus *Eudelus* Förster, 1869									
Eudelus simillimus Taschenberg, 1865	?	?	D	Jul	CAR	E, WP			Sedivy, 1959
Genus *Gelis* Thunberg, 1827									
Gelis agilis (Fabricius, 1775)	3		A,G	Jun-Jul	Anatolia, BSR, EAR	EP, E, WP			Fahringer, 1922
Gelis cursitans (Fabricius, 1775)	1		A	Jun	BSR	E, WP			Çoruh et al., 2014a
Gelis cyanurus (Förster, 1851)	?	?	E	Apr	Anatolia, CAR	E, WP			Diller, 1969
Gelis exareolatus (Förster, 1850)	?	?	D	Jun	CAR	EP, E, WP			Kolarov, 1987
Gelis formicarius (Linnaeus, 1758)	1		B	Jul	BSR	EP, E, WP			Çoruh et al., 2014a
Gelis instabilis (Förster, 1851)	8		A,D	May-Jun-Jul-Aug	Anatolia, EAR, MtR, MR	EP, E, WP			Fahringer, 1922
Gelis micrurus (Förster, 1850)		1	A	Jul	MtR	E, WP			Beyarslan & Kolarov, 1994
Gelis mutillatus (Gmelin, 1790)	1		G	Jun	EAR	EP, E, WP			Çoruh et al., 2014a
Gelis rufipes (Förster, 1876)	2	2	B,C,F	May-Jun-Jul	AR, SAR	E, WP			Beyarslan & Kolarov, 1994
Gelis sculpturator Aubert, 1977	?	?	B	Mar&Jun	CAR	EP, E, WP			Aubert, 1977
Gelis trux (Förster, 1850)	3		A,G	Jun	BSR, EAR	EP, E, WP			Çoruh et al., 2014a

Table 1. Continued

Names of Taxa	IN ♂	IN ♀	VD (m.)	SD	GR	ZR	HR	PVR	FRT
Genus *Grasseiteles* Aubert, 1965									
Grasseiteles ciliator Aubert, 1968	?	?	B	Jun	MtR	EP, E, WP	X		Aubert , 1968
Genus *Glyphicnemis* Förster, 1869									
Glyphicnemis profligator (Fabricius, 1775)	13	2	A,B,D,G	May-Jun-Jul	BSR, EAR, MTR	EP, E, WP			Çoruh & Özbek, 2005
Glyphicnemis vagabunda (Gravenhorst 1829)	49	28	D,E,G,H	Apr&Jun-Jul-Aug	EAR, MtR, MR	EP, E, WP		X	Sawoniewicz, 1985
Genus *Helcostizus* Förster, 1869									
Helcostizus restaurator (Fabricius, 1775)	?	?	A	Mar	MtR	EP, E, NEAR, WP	X		Schimitschek, 1944
Genus *Isadelphus* Förster, 1869									
Isadelphus armatus (Gravenhorst ,1829)	1		D	Jun	MtR	E, WP			Kolarov & Gürbüz, 2007
Genus *Lochetica* Kriechbaumer, 1892									
Lochetica westoni (Bridgman, 1880)	1		D	May	MtR	EP, E, WP			Kolarov & Gürbüz, 2007
Genus *Lysibia* Förster, 1869									
Lysibia nana (Gravenhorst, 1829)	6	6	A,F,E	Apr&Jun-Jul-Aug	AR, MtR, MR	EP, E, NEAR, OCC, ORR, WP	X	X	Fahringer, 1922
Genus *Mesoleptus* Gravenhost, 1829									
Mesoleptus filicornis (Thomson, 1884)	2		A, D	Aug	Anatolia, MtR	EP, E, WP			Kohl, 1905
Mesoleptus incessor (Haliday,1838)	?		?	?	Anatolia				Jussila, 2010
Mesoleptus laevigatus (Gravenhorst, 1820)	2	2	G	Aug	Anatolia, EAR	EP, E, WP			Fahringer, 1922
Mesoleptus laticinctus (Walker, 1874)	1	1	A,B	Jun	Anatolia, BSR	EP, E, ORR, WP			Kolarov, 1987
Mesoleptus marginatus (Thomson, 1884)	4		A,F	May&Jul-Aug-Sep	MtR, MR	E, WP		X	Kolarov, 1987
Mesoleptus scrutator (Haliday, 1838)	8	7	A,D	May-Jun-Jul-Aug	AR, MtR, MR	EP, E, WP			Beyarslan & Kolarov, 1994
Mesoleptus transversor Thunberg, 1822	2		B	Aug	MR	E, WP			Kolarov et al., 1997a
Genus *Phygadeuon* Gravenhorst, 1829									
Phygadeuon trichops Thomson, 1884		1	E	April	MtR	EP, E, WP			Kolarov & Gürbüz, 2007
Phygadeuon vexator (Thunberg, 1822)		2	E	May	MtR	E, WP			Kolarov & Gürbüz, 2007
Genus *Rhembobius* Förster, 1869									
Rhembobius perscrutator (Thunberg, 1822)		1	H	Ju	EAR	EP, E, WP			Çoruh et al., 2016
Rhembobius quadrispinus (Gravenhorst, 1829)	3		A,D	May-Jun-Jul	BSR, MtR, MR	E, WP			Kolarov et al., 1997b
Genus *Stilpnus* Gravenhorts, 1829									
Stilpnus adanaensis Kolarov & Beyarslan, 1994	1		A	May	MR	WP			Kolarov & Beyarslan, 1994
Stilpnus gagates (Gravenhorst, 1807)	3	1	A,E	Jun&Sep	AR	EP, E, NEAR, NTR, OCC, WP			Beyarslan & Kolarov, 1994
Genus *Thaumatogelis* Schwarz, 1995									
Thaumatogelis femoralis (Brischke, 1881)	2		G	Jul	EAR	E, WP		X	Çoruh et al., 2016
Genus *Theroscopus* Föerster, 1850									
Theroscopus hemipterus (Fabricius, 1793)	?	?	G	Sep	AR	E, ORR, WP			Sedivy, 1959
Theroscopus subzonatus (Gravenhorst, 1829)	?	?	C	Jul	CAR	E, WP			Sedivy, 1959
Genus *Zoophthorus* Förster 1869									
Zoophthorus australis (Thomson, 1885)		1	D	May	MtR	E, WP			Kolarov & Gürbüz, 2007
Zoophthorus graculus (Gravenhorst, 1829)	21	1	A	Jun	MR	EP, E, NEAR, NTR, WP			Kolarov & Beyarslan, 1994

Vertical distribution (VD) (m): 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): March: March; Ap: 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. Zoogeographic regions (ZR): AFR: Afrotropical Region, E: Europe, EP: Eastern Palearctic, NEAR: Nearctic Region, NTR: Neotropical, ORR: Oriental, WP: Western Palearctic.

Table 2. Provinces and references of species collected in Turkey

Taxa	Distribution in Turkey	References
	TRIBE CRYPTINI KIRBY, 1837	
Acroricnus seductor (Scopoli, 1786)	Erzurum, Isparta	Fahringer & Friese, 1921; Fahringer, 1922; Schimitschek, 1944; Schmidt, 1954; Sedivy, 1959; Kolarov, 1995; Schwarz, 2005, Gürbüz & Kolarov, 2008; Çoruh & Özbek, 2011; Çoruh et al., 2014b
Acroricnus seductor elegans Mocsary, 1883	Erzurum	Çoruh & Özbek, 2011; Çoruh et al., 2014b
Acroricnus seductor syriacus (Mocsary, 1883)	Isparta	Gürbüz & Kolarov, 2008
Acroricnus stylator (Thunberg, 1822)	Istanbul, Erzurum	Kolarov, 1987; Öncüer, 1991; Kolarov, 1995; Çoruh et al., 2018
Agrothereutes abbreviator (Fabricius, 1793)	Erzurum, Hatay, Kastamonu	Fahringer, 1921; Kolarov & Beyarslan, 1994; Kolarov, 1995; Kolarov & Yurtcan, 2008
Agrothereutes bombycis (Boudier, 1836)	Edirne	Beyarslan & Kolarov, 1994
Agrothereutes fumipennis (Gravenhorst, 1829)	Erzurum, Isparta, Kastamonu	Çoruh & Özbek, 2005; Gürbüz & Kolarov, 2008; Kolarov & Yurtcan, 2008; Gürbüz et al., 2009a; Çoruh et al., 2014b
Agrothereutes grossus (Gravenhorst, 1829)	Kırklareli	Beyarslan & Kolarov, 1994
Agrothereutes hospes (Tschek, 1871)	Isparta, Giresun, Van	Beyarslan & Kolarov, 1994; Gürbüz et al., 2006; Gürbüz & Kolarov, 2008; Çoruh et al., 2014a
Agrothereutes leucorhaeus (Donovan, 1810)	Anatolia	Kolarov & Bordera, 2007
Agrothereutes parvulus (Habermehl, 1926)	Isparta, Giresun, Ordu	Gürbüz & Kolarov, 2008; Çoruh et al., 2014b
Agrothereutes tiloidalis Kolarov & Beyarslan, 1994	Antalya, Edirne	Kolarov & Beyarslan, 1994; Kolarov, 1995
Aritranis buccatus (Tschek, 1872*)*	Adana	Sedivy, 1959; Öncüer, 1991; Kolarov, 1995
Aritranis claviventris (Kriechbaumer, 1894)	Adana, Antalya	Beyarslan & Kolarov, 1994; Gürbüz & Kolarov, 2008
Aritranis coxator Tsckek,1871	Bilecik	Kolarov et al., 1997a
Aritranis director (Thunberg, 1822)	Antalya, Burdur, Erzurum, Isparta, Trabzon, Rize	Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a; Çoruh et al., 2014a, Özdan, 2014; Sarı & Çoruh, 2018, Çoruh et al., 2018
Aritranis femoralis (Gravenhorst, 1829)	Balıkesir, Erzurum	Beyarslan & Kolarov, 1994; Schwarz, 2007; Çoruh & Çoruh, 2008; Çoruh et al., 2014b
Aritranis graefei Thomson, 1896	İzmir	Öncüer, 1991; Kolarov, 1995
Aritranis heliophilus (Tschek, 1871)	Bursa, Edirne, Hatay, Kırklareli	Beyarslan & Kolarov, 1994; Kolarov et al., 1997a, Schwarz, 2007
Aritranis longicauda (Kriechbaumer,1873)	Isparta	Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a,b; Özdan, 2014
Aritranis nigrifemur (Szepligeti, 1916)	Anatolia, Isparta	Sedivy, 1959, Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a
Aritranis nigripes (Gravenhorst, 1829)	Adana	Sediy, 1959; Öncüer, 1991; Kolarov, 1995; Schwarz, 2005
Aritranis occisor (Gravenhorst, 1829*)*	Anatolia, Isparta	Schwarz, 2005; Gürbüz & Kolarov, 2008
Aritranis quadriguttata (Gravenhorst, 1829)	Bursa	Kolarov et al., 1997a; Schwarz, 2007
Aritranis signatoria Fabricius, 1793	Bursa	Kolarov et al., 1997a
Buathra laborator (Thunberg, 1824)	Burdur, Erzurum, Isparta, Trabzon	Gürbüz & Kolarov, 2008; Çoruh & Çoruh, 2012; Çoruh et al., 2014a; Çoruh & Çalmaşur, 2016; Çoruh et al., 2016; Kolarov et al., 2016
Buathra tarsoleucos (Schrank, 1781)	Bursa, Isparta Erzurum	Fahringer, 1922; Kolarov, 1995; Gürbüz & Kolarov, 2008; Özdan 2014; Çoruh et al., 2014b, Kolarov et al., 2014
*Caenocryptus rufiventris (*Gravenhorst, 1829)	Edirne	Sedivy, 1959; Kolarov, 1995
Cryptus armator Fabricius, 1804	Anatolia	Fahringer, 1922; Kolarov, 1995
Cryptus dianae Gravenhorst, 1829	Isparta	Gürbüz & Kolarov, 2008
Cryptus leucocheir (Ratzeburg, 1844)	Konya	Kolarov, 1995; Schwarz, 2015

Table 2. Continued

Taxa	Distribution in Turkey	References
Cryptus minator Gravenhorst, 1829	Kütahya	Kolarov, 1987; Öncüer, 1991; Kolarov, 1995
Cryptus moschator (Fabricius, 1787)	Tunceli	Kolarov et al., 2014; Çoruh et al., 2014b
Cryptus spinosus Gravenhorst, 1829	Adana, Isparta	Sedivy, 1959; Öncüer, 1991; Kolarov, 1995; Gürbüz & Kolarov, 2008; Eroğlu et al., 2011
Cryptus spiralis (Geoffroy, 1785)	Erzurum, Isparta, Karabük, Kars	Çoruh & Özbek, 2005; Çoruh & Çoruh 2008; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a; Çoruh et al., 2014b
Cryptus subspinosus Smith van Burgst, 1913	Anatolia, Isparta	Schwarz, 2005; Gürbüz & Kolarov, 2008
Cryptus triguttatus Gravenhorst, 1829	Afyon, Bursa, Edirne, Muğla	Beyarslan & Kolarov, 1994; Kolarov et al., 1997a; Kolarov et al., 2002; Schwarz, 2015
Cryptus tuberculatus Gravenhorst, 1829	Edirne, Isparta, Tekirdağ	Sedivy, 1959; Kolarov, 1995; Kolarov & Yurtcan 2008; Özdan 2014; Schwarz, 2015
Cryptus viduatorius Fabricius, 1804	Bilecik, Bursa, Erzurum, Isparta, Içel, Kırklareli, Rize, Trabzon	Kolarov, 1987; Beyarslan & Kolarov, 1994; Kolarov, 1995; Kolarov et al., 1997a; Çoruh & Çoruh, 2008; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009b; Çoruh & Çoruh, 2012; Özdan, 2014; Çoruh et al., 2014a, b; Çoruh & Kolarov, 2016; Özdan & Gürbüz, 2016; Çoruh et al., 2016; Kolarov et al., 2016, Sarı & Çoruh, 2018; Çoruh et al., 2018
Enclisis ornaticeps (Thomson, 1885)	Anatolia	Schwarz, 1989; Kolarov, 1995; Kolarov & Bordera, 2007
Gambrus carnifex (Gravenhorst, 1829)	Adana, Afyon, Denizli	Beyarslan & Kolarov, 1994; Kolarov et al., 2002
Gambrus incubitor (Linnaeus, 1758)	Isparta, Rize, Kahramanmaraş	Beyarslan & Kolarov, 1994; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a; Çoruh et al., 2014a
Gambrus inferus Thomson, 1896	Antalya, , Balıkesir, Bilecik istanbul	Kolarov, 1987; Kolarov, 1995; Öncüer, 1991; Beyarslan & Kolarov 1994; Kolarov et al., 1997a
Gambrus opacus Szepligeti, 1916	Erzurum	Çoruh & Özbek, 2005; Çoruh et al., 2014b
Gambrus ornatulus (Thomson, 1873)	Bilecik, Bursa	Kolarov et al., 1997a
Gambrus tricolor (Gravenhorst, 1829)	Kastamonu, Rize	Çoruh & Özbek, 2005; Kolarov & Yurtcan, 2008; Çoruh et al., 2014a,b
Hidryta frater (Cresson, 1864)	Çanakkale	Kolarov et al., 1997a
Hidryta sordida (Tschek, 1871)	Isparta	Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a
Hoplocryptus confector (Gravenhorst, 1829)	Anatolia, Isparta	Schwarz, 2007; Gürbüz & Kolarov, 2008
Hoplocryptus femoralis (Gravenhorst, 1829)	Anatolia, Artvin, Erzurum, Tunceli	Schwarz, 2007; Çoruh & Özbek, 2011, Kolarov et al., 2014; Çoruh et al., 2014b
Hoplocryptus fugitivus (Gravenhorst, 1829)	Erzurum, Isparta	Çoruh & Özbek, 2005; Gürbüz & Kolarov, 2008; Çoruh et al., 2014b
Hoplocryptus murarius (Börner, 1782)	Anatolia, Rize	Schwarz, 2007; Çoruh et al., 2014a,b
Hoplocryptus odoriferator (Dufour & Perris, 1840)	Isparta	Schwarz, 2007; Gürbüz & Kolarov, 2008
Hoplocryptus quadriguttatus (Gravenhorst, 1829)	Isparta	Schwarz, 2007; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a
Idiolispa analis (Gravenhorst, 1807)	Isparta, Gaziantep, Tunceli	Beyarslan & Kolarov, 1994; Gürbüz & Kolarov, 2008; Çoruh et al., 2014b; Kolarov et al., 2014
Ischnus agitator (Oliver, 1792)	Afyon, Denizli, Erzurum, Isparta, İzmir, Uşak	Kolarov et al., 2002; Gürbüz & Kolarov, 2008; Çoruh et al., 2016
Ischnus alternator Gravenhorst, 1829	Bursa, Giresun, Ordu, Rize Trabzon	Kolarov et al., 1997a, Çoruh et al., 2014a, Kolarov et al., 2016
Ischnus inquisitorius (Müller, 1776)	Sinop, Tunceli	Kolarov & Yurtcan, 2008; Çoruh et al., 2014b, Kolarov et al., 2014
Ischnus migrator (Fabricius, 1775)	Adana, Isparta	Fahringer, 1922; Kolarov, 1995; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a
Ischnus minutorius (Fabricius, 1804)	Balıkesir, Edirne, Kırkareli	Beyarslan & Kolarov, 1994
Latibulus argiolus (Rossi, 1790)	Amasya, Ankara, Erzincan, Erzurum, Konya	Fahringer, 1922, Kolarov, 1995; Kolarov & Çalmaşur, 2011; Kolarov & Yurtcan, 2008; Çoruh et al., 2014b, Kolarov et al., 2014

Table 2. Continued

Taxa	Distribution in Turkey	References
Listrocryptus spatulatus Brauns, 1905	Tekirdağ	Beyarslan & Kolarov, 1994
Listrognathus (*Listrognathus*) *furax* (Tschek, 1871)	Isparta	Gürbüz & Kolarov, 2008
Listrognathus ligator Gravenhorst, 1829	Anatolia	Horstmann, 1990; Kolarov, 1995
Listrognathus obnoxius (Gravenhorst, 1829)	Kırkareli	Beyarslan & Kolarov, 1994
Meringopus calescens (Gravenhorst, 1829)	Erzurum, Izmir, Van	Beyarslan & Kolarov, 1994; Schwarz, 2005; Anlaş et al., 2009; Çoruh & Çoruh, 2008; Çoruh & Çoruh, 2012; Çoruh et al., 2014b
Meringopus calescens calescens (Gravenhorst, 1829)	Erzurum	Kolarov et al., 2016
Meringopus calescens persicus Heinrich, 1937	Erzurum	Kolarov & Yurtcan, 2008; Çoruh & Özbek, 2011; Çoruh et al., 2014b, Kolarov et al., 2016
Meringopus cyanator (Gravenhorst, 1829)	Erzurum	Çoruh & Özbek, 2005; Çoruh & Kesdek, 2008; Çoruh & Çoruh, 2008; Çoruh et al., 2014b
Meringopus nigerrimus (Fonscolombe, 1850)	Erzurum	Çoruh & Özbek, 2005, Çoruh et al., 2014b
Meringopus pseudonymus (Tschek, 1872)	Istanbul, Isparta, Erzurum, Tunceli	Kolarov, 1987; Kolarov, 1995; Gürbüz & Kolarov, 2008; Çoruh & Çoruh, 2012; Çoruh et al., 2014b, Kolarov et al., 2014
Meringopus titillator (Linnaeus, 1758)	Antalya, Erzurum, Isparta, Karaman, Kars	Szepligeti, 1916; Kolarov, 1995; Kolarov & Gürbüz, 2007; Çoruh & Çoruh 2002; Çoruh & Özbek, 2011; Çoruh et al., 2014b, Kolarov et al., 2016
Meringopus titillator rhodius (Dalla Torre, 1902)	Erzurum, Isparta	Gürbüz & Kolarov, 2008, Çoruh & Çoruh, 2012; Gürbüz et al., 2009a
Mesostenus albinotatus Gravenhorst, 1829	Adana, Elazığ, Erzurum, Isparta, Rize	Sediy, 1959; Aubert, 1972; Kolarov 1995; Gürbüz & Kolarov, 2008; Çoruh & Çoruh 2008; Gürbüz et al., 2009a; Çoruh et al., 2014a, Kolarov et al., 2016
Mesostenus grammicus Gravenhorst, 1829	Çanakkale, Elazığ, Erzurum, Isparta, İstanbul, Kırklareli	Kolarov, 1987; Kolarov & Beyarslan, 1994; Kolarov, 1995; Kolarov et al., 1997b; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a, Çoruh et al., 2018
Mesostenus transfuga Gravenhorst, 1829	Adana, Antalya, Aydın, Burdur, Bursa, Edirne, Erzurum, Hatay, Isparta, Kırklareli, Mersin, Tekirdağ	Kolarov & Beyarslan, 1994; Kolarov, 1995; Kolarov et al.,1997a; Çoruh & Çoruh, 2008; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a
Myrmeleonostenus italicus (Gravenhorst, 1829)	Antalya, Erzincan, Isparta, Kırklareli, Tunceli, Zonguldak	van Rossem, 1969, Beyaslan & Kolarov, 1994; Kolarov, 1995; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a; Özdan 2014; Çoruh et al., 2014b; Kolarov et al., 2014; Çoruh et al., 2016
Nematopodius formosus Gravenhorst, 1829	Rize	Çoruh et al., 2016
Polytribax perspicillator (Gravenhorst, 1807)	Balıkesir, Edirne	Beyarslan & Kolarov, 1994
Pycnocryptus claviventris Krichbaumer, 1894	Adana, Urfa	Beyarslan & Kolarov, 1994; Kolarov, 1995
Pycnocryptus director (Thunberg, 1822)	Edirne, Isparta, Kırklareli, Tekirdağ	Beyarslan & Kolarov, 1994; Gürbüz et al., 2009a
Pycnocryptus rarus (Hebermehl, 1920)	Bolu	Sedivy, 1959, Öncüer, 1991; Kolarov, 1995
Pycnocryptodes reticulator Aubert, 1971	Isparta	Gürbüz & Kolarov, 2008
Schreineria populnea (Giraud, 1872)	Giresun, Rize	Çoruh et al., 2014a; Kolarov et al., 2016
Stenarella domator (Pado, 1761)	Istanbul, Isparta	Fahringer, 1922, Kolarov, 1995; Gürbüz & Kolarov, 2008, Gürbüz et al., 2009a; Özdan, 2014
Synechocryptus mactator (Tschek, 1870)	Afyon, Istanbul	Kolarov, 1987; Kolarov, 1995, Öncüer, 1991; Schwarz, 1997; Özdemir & Güler, 2009
Thrybius praedator (Rossi, 1792)	Istanbul	Fahringer, 1922; Kolarov, 1995
Trychosis atripes (Gravenhorst, 1829)	Isparta, Kırklareli	Beyarslan & Kolarov, 1994; Gürbüz & Kolarov, 2008
Trychosis legator (Thunberg, 1822)	Adana, Burdur, Çanakkale, Edirne, Erzurum, Gaziantep, Gümüşhane, Isparta, Kırklareli, Tekirdağ, Tunceli, Rize	Kolarov, 1987; Beyarslan & Kolarov, 1994; Kolarov et al., 1997b; Gürbüz & Kolarov, 2008; Çoruh et al., 2014b, Kolarov et al., 2014; Çoruh et al., 2016

Table 2. Continued

Taxa	Distribution in Turkey	References
Trychosis neglecta (Tschek, 1870)	Adana, Istanbul, Isparta	Fahringer, 1922; Sedivy, 1959; Öncüer, 1991; Gürbüz & Kolarov; 2008; Gürbüz et al., 2009a
Trychosis mesocastana (Tschek, 1871)	Çanakkale	Kolarov et al., 1997b
Trychosis pauper (Tschek, 1871)	Çanakkale, Erzurum, Isparta, Tunceli	Kolarov et al., 1997b; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a; Çoruh et al., 2014b; Kolarov et al., 2014a
Trychosis priesneri Rossem, *1971*	Antalya, Konya, Isparta	van Rossem, 1971; Kolarov, 1995; Gürbüz & Kolarov, 2008
Trychosis timenda Rossem, 1990	Adana, Antalya, Edirne, Tekirdağ	Beyarslan & Kolarov, 1994
Trychosis tristator (Tschek, 1871)	Çanakkale, Edirne, Isparta, Kırklareli, Tunceli	Beyarslan & Kolarov, 1994; Kolarov et al., 1997b; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a; Çoruh et al., 2014b, Kolarov et al., 2014
Xylophrurus augustus (Dalman, 1823)	Afyon, Isparta, Konya, Tunceli, Erzurum	Özdemir & Güler, 2009; Özdan, 2014; Çoruh et al., 2014b; Kolarov et al., 2014
Xylophrurus lancifer (Gravenhorst, 1829)	Erzurum	Kolarov et al., 2016
TRIBE HEMIGASTERINI ASHMEAD, 1900		
Aptesis assimilis (Gravenhorst, 1829)	Erzurum	Kolarove t al., 2016; Çoruh et al., 2018
Aptesis cavigena Kolarov & Gürbüz, 2009	Isparta	Kolarov & Gürbüz, 2009
Aptesis cretata (Gravenhorst, 1829)	Bilecik	Kolarov et al., 1997a
Aptesis nigrocincta (Gravenhorst, 1815)	Tunceli	Kolarov et al., 2014; Çoruh et al., 2014b
Aptesis senicula (Kriechbaumer, 1893)	Adana, Mersin, Tunceli, Rize	Beyarslan & Kolarov, 1994; Kolarov et al., 2014; Çoruh et al., 2014b, Kolarov et al., 2016
Giraudia gyratoria (Thunberg, 1824)	Istanbul	Fahringer, 1922, Kolarov, 1995
Parmortha pleuralis (Thomson, 1873)	Bilecik	Kolarov et al., 1997a
Pleolophus brachypterus (Gravenhorst, 1815)	Istanbul, Tunceli	Fahringer, 1922, Kolarov, 1995; Çoruh et al., 2014b, Kolarov et al., 2014
Polytribax rufipes (Gravenhorst, 1829)	Izmir	Fahringer, 1921, Kolarov, 1995
TRIBE PHYGADEUONTINI FORSTER, 1869		
Aclastus gracilis (Thomson, 1884)	Bilecik, Çanakkale, Isparta	Kolarov et al., 1997a, b, Kolarov & Gürbüz, 2007; Gürbüz et al., 2009a
Aclastus micator (Gravenhorst, 1807)	Adana, Afyon, Antalya, Hatay, Isparta, Muğla	Beyarslan & Kolarov, 1994; Kolarov et al., 2002
Aclastus solutus (Thomson, 1984)	Adana, Afyon, Muğla	Beyarslan & Kolarov, 1994; Kolarov et al., 2002
Aclastus transversalis Horstman, 1980	Isparta	Kolarov & Gürbüz, 2007
Acrolyta distincta Bridgman, 1883	Bilecik, Bursa	Kolarov et al., 1997a
Acrolyta semistrigosa (Schmiedeknecht 1897)	Isparta	Kolarov & Gürbüz, 2007
Atractodes (***Asyncrita***) *assimilis* Förster, 1876	Adana, Kahramanmaraş	Beyarslan & Kolarov, 1994; Jussila, 2001
Atractodes (***Asyncrita***) *foveolatus* (Gravenhorst, 1829)	Rize	Beyarslan & Kolarov, 1994; Jussila, 2001
Atractodes (Atractodes) fumatus Haliday, 1838	Antalya	Beyarslan & Kolarov, 1994
Atractodes (Atractodes) pusillus Förster, 1876	Adana	Beyarslan & Kolarov, 1994; Jussila, 2001
Bathythrix claviger (Taschenberg, 1865)	Istanbul	Schimitschek, 1944; Kolarov, 1995
Bathythrix collaris (Thomson, 1896)	Rize	Çoruh et al., 2016
Bathythrix decipiens (Gravenhorst, 1829)	Isparta, Sinop	Kolarov & Gürbüz, 2007; Kolarov & Yurtcan, 2008
Bathythrix fragilis (Gravenhorst, 1829)	Ordu	Çoruh et al., 2016

Table 2. Continued

Taxa	Distribution in Turkey	References
Bathythrix lamina (Thomson, 1884)	Çanakkale, Isparta, Kastamonu, Rize	Kolarov et al., 1997a; Kolarov & Gürbüz 2007; Kolarov & Yurtcan 2008; Gürbüz et al., 2009a; Çoruh et al., 2014a
Bathythrix linearis (Gravenhorst, 1829)	Rize	Çoruh et al., 2014a
Bathythrix pellucidator (Gravenhorst, 1829)	Rize, Ordu	Çoruh et al., 2014a
Blapsidotes vicinus (Gravenhorst 1829)	Antalya, Burdur, Kastamonu, Isparta	Kolarov & Gürbüz, 2007; Kolarov & Yurtcan, 2008
Ceratophygadeuon anurus (Thomson, 1884)	Van	Horstmann, 1993; Kolarov, 1995
Chirotica decorator (Villers, 1789)	Istanbul	Kolarov, 1987; Kolarov, 1995
Chirotica insignis (Gravenhorst, 1829)	Kars	Çoruh & Kolarov, 2016
Chirotica orientalis Horstmann, 1983	Diyarbakır	Kolarov & Erkin, 1987; Kolarov, 1995
Chirotica ruficeps Horstmann, 1983	Kars	Horstmann, 1993; Kolarov, 1995
Chirotica terebrator Horstmann, 1983	Diyarbakır	Horstmann, 1983; Kolarov, 1995
Diaglyptellana punctatus (Holmgren, 1857)	Ankara	Sedivy, 1959; Kolarov, 1995
Diaglyptellodes sculpturator (Aubert, 1977)	Anatolia, Isparta	Aubert, 1977; Schwarz, 2003; Kolarov & Gürbüz; 2007
Dichrogaster aestivalis (Gravenhorst, 1829)	Adana, Afyon, Antalya, Burdur, Çanakkale, Denizli, Edirne, Elazığ, Gaziantep, Isparta, Kahramanmaraş, Şanlıurfa, Tekirdağ	Beyarslan & Kolarov, 1994; Kolarov et al., 1997b, Kolarov et al., 2002; Kolarov & Gürbüz 2007; Gürbüz et al., 2009a; Kolarov et al., 2002
Dichrogaster diatropus Townes, 1983	Bursa, Çanakkale, Konya	Townes, 1983; Kolarov, 1995; Kolarov et al., 1997a
Dichrogaster liostylus Thomson, 1885	Samsun, Rize	Kolarov, 1995; Çoruh et al., 2014a
Dichrogaster longicaudata (Thomson 1884)	Erzurum, Eskişehir, Isparta	Townes, 1983; Kolarov & Gürbüz, 2007; Kırtay, 2008; Gürbüz et al., 2009a; Quike et al., 2009; Eroğlu et al., 2011; Çoruh et al., 2016
Dichrogaster modesta (Gravenhorst, 1829)	Bursa, Kastamonu, Sinop	Kolarov et al., 1997a; Kolarov & Yurtcan 2008
Dichrogaster perlae (Dounmerc, 1855)	Isparta	Kolarov & Gürbüz, 2007
Dichrogaster saharator (Aubert, 1964)	Çanakkale, Isparta	Kolarov et al., 1997b; Kolarov & Gürbüz 2007
Dichrogaster schimitscheki (Fahringer, 1935)	Isparta	Kolarov & Gürbüz, 2007; Gürbüz et al., 2009a
Echthrus reluctator (Linnaeus, 1758)	Istanbul	Fahringer, 1922; Kolarov, 1995
Encrateola laevigata (Ratzeburg, 1848)	Adana, Giresun, Erzurum, Hatay	Beyarslan & Kolarov 1994; Çoruh et al., 2014a, Çoruh et al., 2016
Endasys brevis (Gravenhorst, 1829)	Anatolia, Isparta	Sawoniewicz, & Luhman, 1992; Kolarov & Gürbüz 2007; Gürbüz et al., 2009a
Endasys erythrogaster (Gravenhorst, 1829)	Ankara	Kolarov, 1987; Kolarov, 1995
Endasys femoralis (Habermehl 1912)	Isparta	Kolarov & Gürbüz 2007; Gürbüz et al., 2009a
Endasys minutulus (Thomson 1883)	Isparta	Kolarov & Gürbüz 2007; Gürbüz et al., 2009a
Endasys parviventris (Gravenhorst, 1929)	Anatolia	Sawoniewicz, & Luhman, 1992; Kolarov, 1995
Endasys plagiator (Gravenhorst, 1829)	Anatolia, Erzurum, Isparta	Sawoniewicz, & Luhman, 1992; Kolarov, 1995; Kolarov & Bordera, 2007; Kolarov & Gürbüz, 2007; Gürbüz et al., 2009a; Çoruh et al., 2014a, Kolarov et al., 2016
Endasys rubricator (Thunberg, 1822)	Ankara	Kolarov, 1987; Kolarov, 1995
Endasys senilis (Gmelin 1790)	Isparta	Kolarov & Gürbüz, 2007
Eudelus simillimus Taschenberg, 1865	Ankara	Sedivy, 1959; Kolarov, 1995
Gelis agilis (Fabricius, 1775)	Anatolia, Erzincan, Giresun, Trabzon	Fahringer, 1922; Kolarov et al., 2016
Gelis cursitans (Fabricius, 1775)	Rize	Çoruh et al., 2014a
Gelis cyanurus (Förster, 1851)	Anatolia, Akşehir	Diller, 1969; Kolarov, 1995; Schwarz, 1998

Table 2. Continued

Taxa	Distribution in Turkey	References
Gelis exareolatus (Förster, 1851)	Ankara	Kolarov, 1987; Öncüer, 1991; Kolarov, 1995
Gelis formicarius (Linnaeus, 1758	Rize	Çoruh et al., 2014a
Gelis instabilis (Foerster, 1851)	Anatolia, Adana, Antalya, Burdur, Çanakkale, Edirne, Elazığ, Kırklareli	Fahringer, 1922, Kolarov, 1995, Beyarslan & Kolarov 1994; Kolarov et al., 1997b
Gelis micrurus (Förster, 1850)	Antalya	Beyarslan & Kolarov, 1994
Gelis mutillatus (Gmelin, 1790)	Erzurum	Çoruh et al., 2014a
Gelis rufipes (Förster, 1876)	Afyon, Denizli, Kahramanmaraş	Beyarslan & Kolarov, 1994; Kolarov et al., 2002
Gelis sculpturator Aubert, 1977	Ankara, Kırıkkale	Aubert, 1977; Kolarov, 1995
Gelis trux (Förster, 1850)	Erzurum, Rize	Çoruh et al., 2014a
Grasseiteles ciliator Aubert, 1968	Adana, Hatay	Aubert, 1968; Kolarov, 1995
Glyphicnemis profligator (Fabricius, 1775)	Isparta, Erzurum, Trabzon	Çoruh & Özbek, 2005; Kolarov & Gürbüz 2007; Çoruh et al., 2014a,b; Kolarov et al., 2016
Glyphicnemis vagabunda (Gravenhorst,1829)	Adana, Edirne, Erzurum, Isparta	Sawoniewicz, 1985; Beyarslan & Kolarov, 1994; Kolarov & Gürbüz 2007, Kolarov & Bordera, 2007; Çoruh & Çoruh, 2008; Çoruh et al., 2014a; Kolarov et al., 2016; Çoruh et al., 2018
Helcostizus restaurator (Fabricius, 1775)	Istanbul	Schimitschek, 1944; Kolarov, 1995
Isadelphus armatus (Gravenhorst, 1829)	Isparta	Kolarov & Gürbüz, 2007
Lochetica westoni (Bridgman, 1880)	Antalya	Kolarov & Gürbüz, 2007
Lysibia nana (Gravenhorst, 1829)	Adana, Aydın, Balıkesir, Bursa, Edirne, Isparta, Istanbul, İzmir	Fahringer, 1922; Kolarov & Beyarslan, 1994; Kolarov, 1995; Kolarov et al., 1997a; Kolarov et al., 2002; Kolarov & Gürbüz 2007; Çoruh et al., 2014b
Mesoleptus filicornis (Thomson, 1884)	Antalya, Hatay	Kohl, 1905; Beyarslan & Kolarov, 1994
Mesoleptus incessor (Haliday,1838)	Anatolia	Jussila, 2010
Mesoleptus laevigatus (Gravenhorst, 1820)	Anatolia, Erzurum	Fahringer, 1922; Kolarov et al., 2014; Çoruh et al., 2014b
Mesoleptus laticinctus (Walker, 1874)	Anatolia, Rize	Kolarov, 1987; Çoruh et al., 2014a
Mesoleptus marginatus (Thomson, 1884)	Edirne, Hatay, İstanbul, Tekirdağ	Kolarov, 1987; Beyarslan & Kolarov, 1994
Mesoleptus scrutator (Haliday, 1838)	Afyon, Antalya, Balıkesir, Denizli, Isparta, İzmir, Uşak	Beyarslan & Kolarov, 1994; Kolarov et al., 2002
Mesoleptus transversor Thunberg, 1822	Bilecik	Kolarov et al., 1997a
Phygadeuon trichops Thomson, 1884	Isparta	Kolarov & Gürbüz, 2007
Phygadeuon vexator (Thunberg, 1822)	Isparta	Kolarov & Gürbüz, 2007; Gürbüz et al., 2009a
Rhembobius perscrutator (Thunberg, 1822)	Erzurum	Çoruh et al., 2016
Rhembobius quadrispinus (Gravenhorst, 1829)	Çanakkale, Giresun, Isparta	Kolarov et al., 1997b; Kolarov & Gürbüz, 2007; Kolarov et al., 2016
Stilpnus adanaensis Kolarov & Beyarslan, 1994	Adana	Kolarov & Beyarslan, 1994; Kolarov, 1995
Stilpnus gagates (Gravenhorst, 1807)	Mersin	Beyarslan & Kolarov, 1994
Thaumatogelis femoralis (Brischke, 1881)	Erzincan, Erzurum	Çoruh et al., 2016
Theroscopus hemipterus (Fabricius, 1793)	Afyonkarahisar	Sedivy, 1959; Kolarov, 1995
Theroscopus subzonatus (Gravenhorst, 1829)	Ankara	Sedivy, 1959; Kolarov, 1995
Zoophthorus australis (Thomson, 1885)	Isparta	Kolarov & Gürbüz; 2007
Zoophthorus graculus (Gravenhorst, 1829)	Çanakkale, Edirne, Kırklareli	Kolarov & Beyarslan, 1994; Kolarov et al., 1997b

Table 3. Parasitoids Cryptinae species reared from different hosts in Turkey

Names of Taxa	Hosts Name	Order and Family of Hosts	Reference (s)
TRIBE CRYPTINI KIRBY, 1837			
Agrothereutes hospes (Tschek, 1871)	*Galleria mellonella* (L.)	Lepidoptera: Pyralida	Gürbüz et al., 2006
Aritranis graefei Thomson, 1896	*Agapantia villasoviridescens* Deg.	Coleoptera: Cerambycidae.	Öncüer, 1991
Buathra laborator (Thunberg, 1824)	*Malacosoma neustria* L.	Lepidoptera: Lasiocampidae	Çoruh & Çalmaşur, 2016
Cryptus minator Gravenhorst, 1829	*Tarpa* sp.	Lepidoptera	Kolarov, 1987
Gambrus opacus Szepligeti, 1916	*Malacosoma neustria* L.	Lepidoptera: Lasiocampidae	Çoruh & Özbek, 2005
Meringopus cyanator (Gravenhorst, 1829)	*Lymantria dispar* L.	Lepidoptera: Lymantriidae	Çoruh & Özbek, 2005
	Malacosoma neustria L.	Lepidoptera: Lasiocampidae	
Mesostenus transfuga Gravenhorst, 1829	*Cadra cautella* Walk	Lepidoptera: Crambidae	Kolarov, 1995
	Plodia interpunctella Hb.	Lepidoptera: Pyralidae	
TRIBE PHYGADEUONTINI FORSTER, 1869			
Bathythrix claviger (Taschenberg, 1865)	*Phymatodes alni* L.	Coleoptera: Cerambycidae	Kolarov, 1995
Chirotica orientalis Horstmann, 1983	*Psychidae* sp.	Lepidoptera: Psychidae	Kolarov, 1995
Chirotica terebrator Horstmann, 1983	*Amicta oberthuri* Hey.	Lepidoptera: Psychidae	Kolarov, 1995
Echthrus reluctator (Linnaeus, 1758)	*Ergates faber* (L.)	Coleoptera: Cerambycidae	Kolarov, 1995
Endasys erythrogaster (Gravenhorst, 1829)	*Socieras pyricola* Wocke	Lepidoptera: Nepticulidae	Kolarov, 1995
Grasseiteles ciliator Aubert, 1968	*Aonidiella auranti* (Maskell)	Hemiptera: Diaspididae	Kolarov, 1995
Helcostizus restaurator (Fabricius, 1775)	*Phymatodes pusillus* var. *humeralis* Com.	Coleoptera: Cerambycidae	Kolarov, 1995
	Rhopalopus clavipes (F.)		
Lysibia nana (Gravenhorst, 1829)	*Vanessa* sp.	Lepidoptera: Nymphalidae	Kolarov, 1995
	Apanteles glomeratus L.	Hymenoptera: Braconidae	

Table 4. Plants visited by Cryptinae species in Turkey

Names of Taxa	Hosts Name	Order and Family of Hosts	Reference (s)
TRIBE CRYPTINI KIRBY, 1837			
Agrothereutes abbreviator (Fabricius, 1793)	*Zea mays* L.	Family: Poaceae	Kolarov & Yurtcan, 2008
	Beta vulgaris L.	Family: Chenopodiaceae	
Agrothereutes fumipennis (Gravenhorst, 1829)	*Zea mays* L.	Family: Poaceae	Kolarov & Yurtcan, 2008
	Beta vulgaris L.	Family: Chenopodiaceae	
Aritranis femoralis (Gravenhorst, 1829)	*Carum carvi* L.	Family: Apiaceae	Çoruh & Çoruh, 2008
Aritranis graefei Thomson, 1896	*Cynara* sp.	Family: Asteraceae	Öncüer, 1991
Buathra laborator (Thunberg, 1824)	*Phragmites australis* (Cav.) Steud.	Family: Poaceae	Çoruh & Çoruh, 2012
	Polygonum bistorta L. Samp.	Family: Polygonaceae	
	Mentha longifolia (L.) Huds.	Family: Lamiaceae	
	Medicago sativa L.	Family: Fabaceae	Çoruh et al., 2016
	Elaeagnus angustifolia L.	Family: Elaeagnaceae	Çoruh & Çalmaşur, 2016
Cryptus armator Fabricius, 1804	*Eryngium campestre* L.	Family: Apiaceae	Kolarov, 1995

Table 4. Continued

Names of Taxa	Hosts Name	Order and Family of Hosts	Reference (s)
Cryptus spiralis (Geoffroy, 1785)	*Daucus carota* L.	Family: Apiaceae	Çoruh & Çoruh, 2008
	Ferula comminis L.		
Cryptus viduatorius Fabricius, 1804	*Daucus carota* L.	Family: Apiaceae	Çoruh & Çoruh, 2008
	Ferula comminis L.		
	Mentha longifolia (L.)	Family: Lamiaceae	Çoruh & Çoruh, 2012
	Daucus carota L.	Family: Apiaceae	Çoruh & Kolarov, 2016
	Medicago sativa L.	Family: Fabaceae	Çoruh et al., 2016
	Ferula orientalis L.	Family: Apiaceae	Kolarov et al., 2016
Ischnus agitator (Oliver, 1792)	*Medicago sativa* L.	Familya: Fabaceae	Çoruh et al., 2016
Ischnus migrator (Fabricius, 1775)	*Styrax offiicinalis* L.	Familya: Styracaceae	Kolarov, 1995
Latibulus argiolus (Rossi, 1790)	*Achillea micrantha* Th.	Family: Asteraceae	Kolarov, 1995
Meringopus calescens (Gravenhorst, 1829)	*Carum carvi* L.	Family: Apiaceae	Çoruh & Çoruh, 2008
	Phragmites austrialis (Cav.) Trin.ex Steudel.	Family: Poaceae	Çoruh & Çoruh, 2012
	Polygonum bistorta L.	Family: Polygonaceae	
	Mentha longifolia (L.) Hudson	Family: Lamiaceae	
	Myricaria germanica (L.) Desv.	Family: Tamaricaceae	
	Salix triandra L. (Salicaceae)	Family: Salicaceae	
Meringopus calescens calescens (Gravenhorst, 1829)	*Ferula comminis* L.	Family: Apiaceae	Kolarov et al., 2016
Meringopus cyanator (Gravenhorst, 1829)	*Carum carvi* L.	Family: Apiaceae	Çoruh & Çoruh, 2008
Meringopus pseudonymus (Tschek, 1872)	*Polygonum bistorta* L.	Family: Polygonaceae	Çoruh & Çoruh, 2012
Meringopus titillator (Linnaeus, 1758)	*Carum carvi* L.	Family: Apiaceae	Çoruh & Çoruh, 2008
	Seselis libanotis (L.) W. Koch		
	Ferula orientalis L.	Family: Apiaceae	Kolarov et al., 2016
Meringopus titillator rhodius (Dalla Torre, 1902)	*Mentha longifolia* (L.) Hudson	Family: Lamiaceae	Çoruh & Çoruh, 2012
Mesostenus albinotatus Gravenhorst, 1829	*Pimpinella tragium* Vill.	Familya: Apiaceae	Çoruh & Çoruh, 2008
	Euphorbia stricta L.	Familya: Euphorbiaceae	Kolarov et al., 2016
Mesostenus transfuga Gravenhorst, 1829	*Pimpinella tragium* Vill.	Familya: Apiaceae	Çoruh & Çoruh, 2008
	Seselis libanotis (L.) W. Koch		
Myrmeleonostenus italicus (Gravenhorst, 1829)	*Medicago sativa* L.	Family: Fabaceae	Çoruh et al., 2016
Stenarella domator (Pado, 1761)	*Sambucus ebulus* L.	Family: Adoxaceae	Kolarov, 1995
Trychosis neglecta (Tschek, 1870)	*Hypericum rhodopaeum* Friv.	Family: Clusiaceae	Kolarov, 1995
	TRIBE HEMIGASTERINI ASHMEAD, 1900		
Giraudia gyratoria (Thunberg, 1824)	*Heracleum platytenium* Boiss.	Family: Apiaceae	Kolarov, 1995
Pleolophus brachypterus (Gravenhorst, 1815)	*Heracleum platytenium* Boiss.	Family: Apiaceae	Kolarov, 1995
Polytribax rufipes (Gravenhorst, 1829)	*Achillea santolonia* L.	Family: Asteraceae	Kolarov, 1995

Table 4. Continued

Names of Taxa	Hosts Name	Order and Family of Hosts	Reference (s)
	TRIBE PHYGADEUONTINI FORSTER, 1869		
Chirotica terebrator Horstmann, 1983	*Lens esculenta* Moench	Family: Fabaceae	Kolarov, 1995
Dichrogaster liostylus Thomson, 1885	*Coryllus avellana* L.	Family: Betulaceae	Kolarov, 1995
Dichrogaster longicaudata (Thomson 1885)	*Medicago sativa* L.	Family: Fabaceae	Çoruh et al., 2016
Dichrogaster modesta (Gravenhorst, 1829)	*Zea mays* L.	Family: Poaceae	Kolarov & Yurtcan, 2008
	Beta vulgaris L.	Family: Chenopodiaceae	
Echthrus reluctator (Linnaeus, 1758)	*Pinus brutia* Ten.	Family: Pinaceaea	Kolarov, 1995
Encrateola laevigata (Ratzeburg, 1848)	*Medicago sativa* L.	Family: Fabaceae	Çoruh et al., 2016
Glyphicnemis vagabunda (Gravenhorst, 1829)	*Carum carvi* L.	Family: Apiaceae	Çoruh & Çoruh, 2008 Kolarov et al., 2016
	Seselis libanotis (L.) W. Koch	Family: Apiaceae	Çoruh & Çoruh, 2008
Lysibia nana (Gravenhorst, 1829)	*Cynara* sp.	Family: Asteraceae	Kolarov, 1995
Mesoleptus marginatus (Thomson, 1884)	*Sambucus ebulus* L.	Family: Adoxaceae	Kolarov, 1995
Thaumatogelis femoralis (Brischke, 1881)	*Medicago sativa* L.	Family: Fabaceae	Çoruh et al., 2016

From Table 1 it can be seen that 97 species and 28 genera belonging to tribe Cryptini; nine species and five genera tribe Hemigasterini; 81 species and 28 genera tribe Phygadeuontini were recorded. Cryptini had the greatest number of species (Figure 3a).

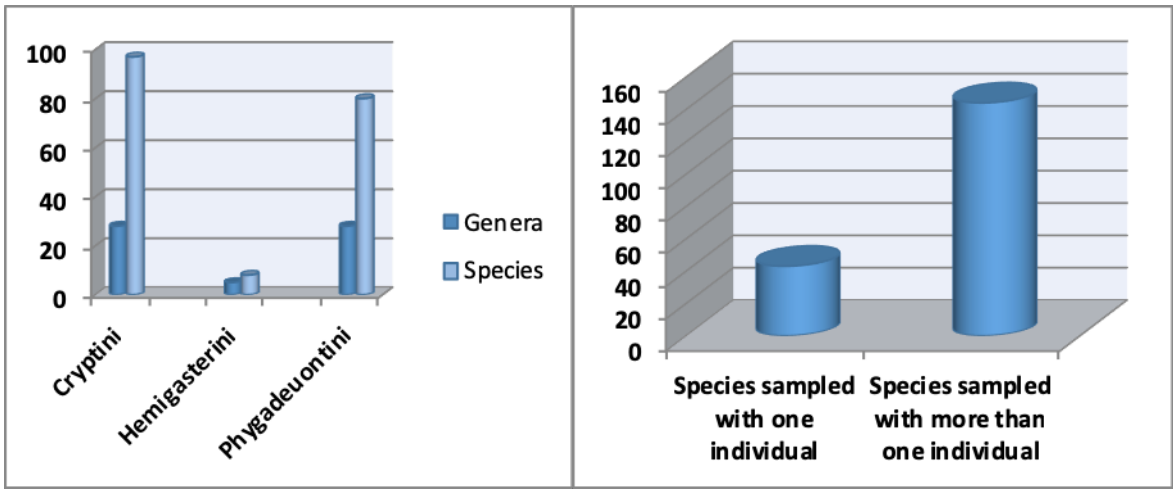

Figure 3. Number of species: a) according to per tribe; b) according to individuals.

In the Cryptini, *Meringopus calescens* (Figure 1a) was the most abundant species, with 299 individuals. This is followed by *Cryptus viduatorius* (106), *Aritranis director* (77), *Glyphicnemis vagabunda* (77) and *Dichrogaster aestivalis* (49), respectively.

Despite all this, many species were collected as a single individuals in the study area. These species were *Acroricnus seductor*, (Figure 1b) *A. seductor elegans*, *A. seductor syriacus*, *Aptesis cavigena, Aritranis occisor*, *A. quadriguttata*, *Cryptus moschator*, *C. subspinosus, Hidryta frater*, *Hoplocryptus confector, H. odoriferator*, *Listrocryptus spatulatus*, *Meringopus nigerrimus*, *Nematopodius formosus*, *Pycnocryptus claviventris*, *Pycnocryptodes reticulator*, *Trychosis mesocastana, Xylophrurus lancifer*,

Aptesis cretata, A. nigrocincta, Pleolophus brachypterus, *Acrolyta semistrigosa*, *A. (Ansyrtia) foveolatus*, *Atractodes (A.) fumatus*, *A. (A.) pusillus*, *Bathythrix fragilis*, *Chirotica insignis*, *C. orientalis*, *C. terebrator, Diaglyptellodes sculpturator*, *Dichrogaster perlae*, *Endasys femoralis*, *E. senilis, Gelis cursitans*, *G. formicarius*, *G. micrurus*, *G. mutillatus, Isadelphus armatus*, *Lochetica westoni*, *Phygadeuon trichops*, *Rhembobius perscrutator*, *Stilpnus adanaensis* and *Zoophthorus australis* (Figure 3b).

Additionally, Table 2 shows distribution of each species according to province in the seven different regions.

Ecological evaluations

Numerous physical parameters that influence insect physiology vary substantially with altitude, including temperature, air density and oxygen partial pressure (Dillon et al., 2006).

Samples were collected eight altitude ranges (Table 1) with 68 species collected between 0-500 m (A), 25 species between 501-750 (B), 25 species between 751-1000 (C), 75 species between 1001-1250 (D), 40 species between 1251-1500 (E), 24 species between 1501-1750 (F), 22 species between 1751-2000 (G), 19 species between 2001-2500 (H) (Figure 4a).

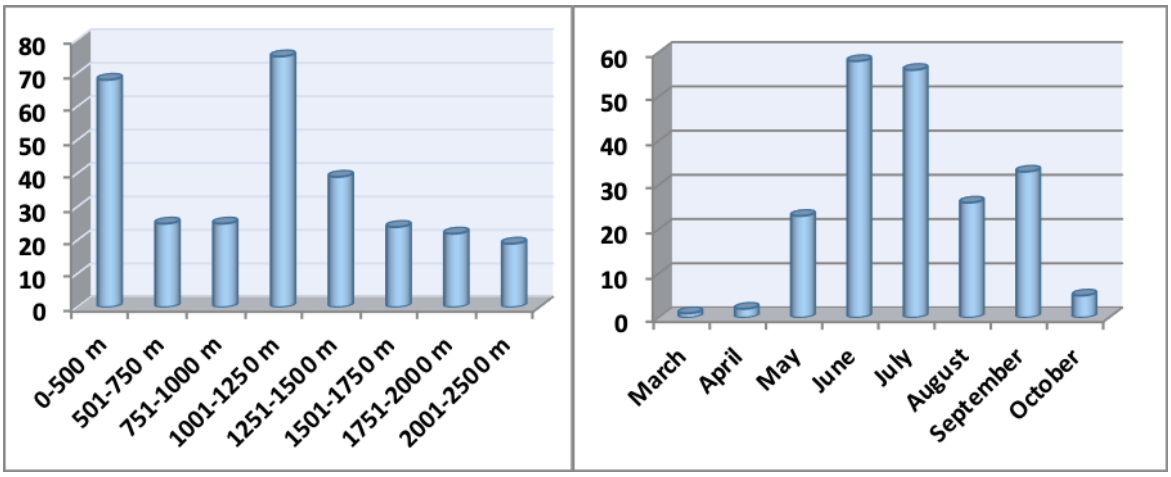

Figure 4. Number of species: a) according to altitude range; b) according to months.

Figure 4a shows that most (40.1%) of the insects were collected between 1001-1250 m, and least (10.2%) samples were collected between 2001-2500 m. Also, 108 species were found one altitude range, and only 13 species were determined from four different range. Altitude was an important factor in species distribution.

Seasonal climatic conditions can exert a strong influence on insect abundance and activity (Vasconcellos et al., 2010). Figure 4b show that the insects were collected in 8 months of the year.

The most insect were collected in June, but on a few were collected in the first month of spring and the last month of autumn (March and October) (Figure 4b). *Agrothereutes fumipennis* was collected in six months, *Cryptus viduatorius* and *Trychosis legator* in five months (Table 1). Also 103 species were collected in only one month.

Zoogeographic evaluations

Geographic distribution is one of the major characteristics of any animal taxon, be it species, genus or family. A general comprehension of geographic distributions of major taxa is essential to understand natural environments, to recognize species diversity patterns and to plan conservation strategies (Gaston, 2000; Myers et al., 2000; Lamoreux et al., 2006).

The study area consisted of seven geographic different regions in Turkey. Most of the samples (110) were collected from the Mediterranean Region. Only eight species were collected from South East Anatolia

(Figure 5a). *Trychosis legator* and *Dichrogaster aestivalis* were collected five regions. However, 52% of species were collected from only a single region.

The Mediterranean Region is dominant region for the cryptine species, followed by Eastern Anatolia (57) and Marmara region (45).

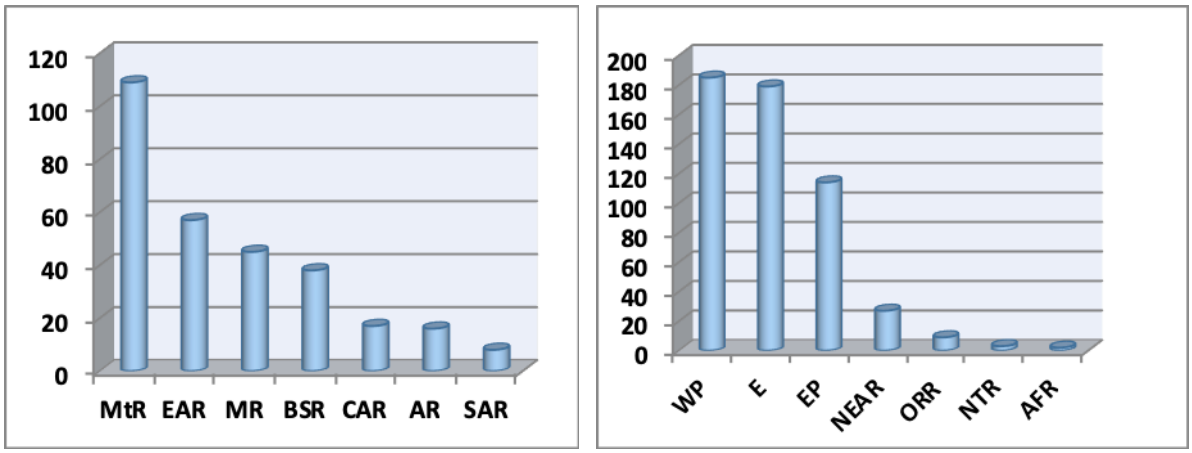

Figure 5. Number of species: a) according to geographic regions; b) according to zoogeographic region.

There are seven global regions for zoogeographic distribution. The regional distribution of the species listed in Table 1 was 186 species Western Palearctic (99.4%), 179 species European (95.7%), 114 species Eastern Palearctic (60.9%), 27 species Nearctic (14.4%), nine species Oriental (4.8%), three species Neotropical (1.6%), two species Afrotropical (1.0%). In conclusion, Western Palearctic and European have the highest numbers of species (Figure 5b). All species were distributed in the Western Palearctic Region. Of this species, *Lysibia nana* and *Stilpnus gagates* were found six zoogeographic regions. Notably, while *Stilpnus gagates* has been found to be have a wide global distribution, it was only found in one region of Turkey. Similarly, *Xylophrurus augustus* was found five different geographic regions of Turkey, but is only common in Europe and Western Palearctic Regions.

Some important observations are also given in Table 1 is examined. For example, although *A. seductor elegans* has a wide global distribution, only one specimen of it has been reported (Schimitschek, 1944) in Turkey and since 1944, this species has not been found in Turkey. Another example is *Agrothereutes tiloidalis*, which has only been found in Turkey. *Agrothereutes tiloidalis* is endemic to Turkey. It is notable that *Chirotica orientalis* is present only Israel, Syria and Turkey.

Evaluations of hosts and plants visited by adults

Cryptinae can be found in mostl kinds of habitats globally. Typically they are parasitic in cocoons of the Lepidoptera, sawflies, braconids, ichneumonids and Neuroptera. Some of them attack egg cocoons of spiders and pupae of Diptera (Azura & Idris, 2002).

In this study, a total of 15 Cryptinae (Figure 6a) species came from 17 different hosts (Table 3). At the same time, four species have got two different hosts. The order Lepidoptera were the most numerous of the hosts (Figure 6b).

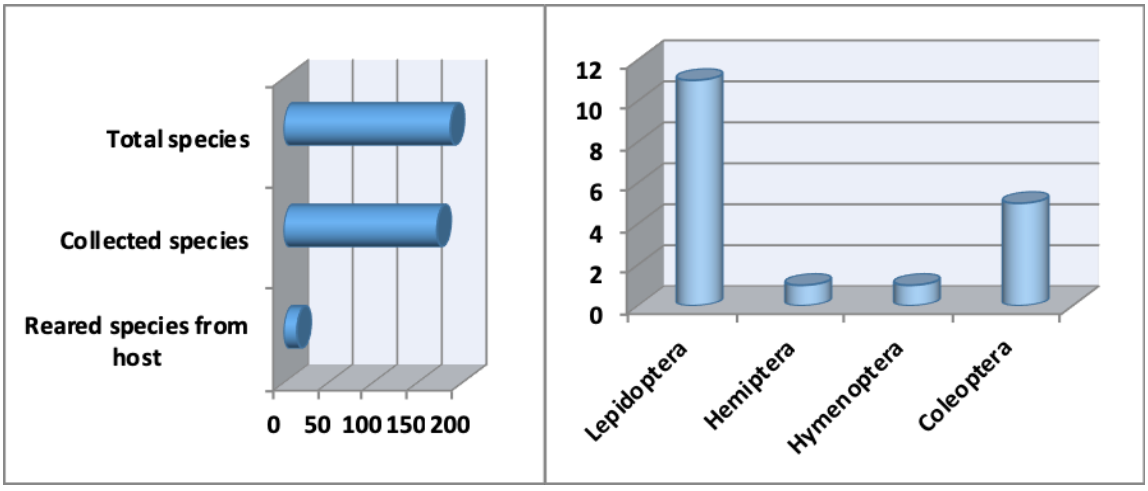

Figure 6. Number of species: a) according to reared from different hosts; b) according to order.

Malacosoma neustria was a host of three different species. Of these, *Buathra laborator* was reared from *M. neustria* feeding on *Elaeagnus angustifolia* in Erzurum. *Malacosoma neustria* was recorded a new host for this species in Turkey (Çoruh & Çalmaşur, 2016). This species was previously reared from *M. neustria* (Meyer, 1929).

Moreover, *Meringopus cyanator* and *Gambrus opacus* reared from *M. neustria* as a result of this work also (Çoruh & Özbek, 2005). *Gambrus opacus* is only known to have one host anywhere in the world (Yu et al., 2016).

In addition, plant-insect relationships are of great importance in ecosystem (Petanidou & Lamborn, 2005). Table 4 shows that there were 27 species of plants visited by the 35 cryptine species (Figure 7a), with *Medicago sativa* being the most visited plant (Figure 7b).

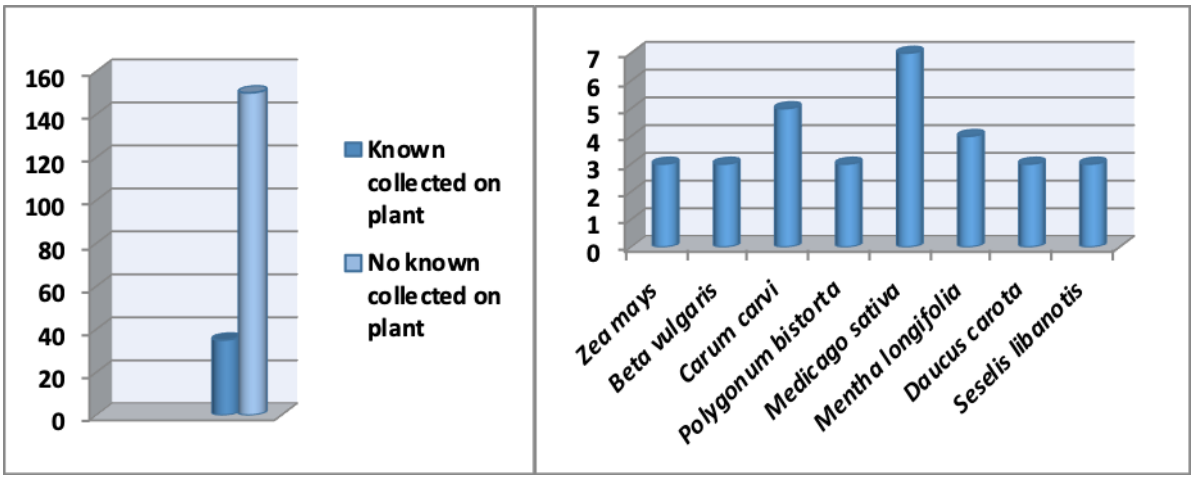

Figure 7. Number of species: a) according to collected plants; b) according to collected plants species.

The data presented here will help in the design of future studies and will assist taxonomists who are working on he subfamily Cyrptinae. These results will help to more comprehensively identify research needs and speed up the advancement of knowledge for this group of important insects.

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