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Biogeography and Host Evaluation of the Subfamily Pimplinae (Hymenoptera: Ichneumonidae) in Turkey

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ABSTRACT

This study was carried out to determine the faunistic, ecological, zoogeographical and hosts situation of the subfamily Pimplinae (Hymenoptera: Ichneumonidae) in Turkey. As a result of the study, 100 species belonging to 30 genera and three tribes were identified. These samples are added into literature examining the whole Turkey in the last two decade. For each species, individual diversity, biogeographical and zoogeographical regions, altitudinal distribution, seasonal dynamics, available host data, plants visited by adults and first record of the species from for Turkey are summarised.

Key words: Ichneumonidae, Pimplinae, new records, Turkey, zoogeographical, characterization.

INTRODUCTION

Ichneumonidae is the biggest hymenopteran family including 1.579 genera and 24.281 described species (Yu *et al*., 2012). However, it should be emphasized that every year many new species are added to this number.

The subfamily Pimplinae is biologically the most diverse, and probably the most extensively studied, within the Ichneumonidae (Fitton *et al*., 1988). Worldwide the subfamily comprises about 78 genera and 1685 species (Yu *et al*., 2012). This group is a moderately large group but, because it includes several big, strikingly-coloured or common species, it is often numerically the best represented subfamily in general collections of Ichneumonidae (Fitton *et al*., 1988).

The majority of pimplines are ectoparasitoids of immature Lepidoptera, Coleoptera, Hymenoptera, Diptera or Arachnida, while some are pseudo-parasitoids of spider egg sacs and one group are endoparasitoids in endopterygote pupae and prepupae. Several species are hyperparasitic, often facultatively, and a few are cleptoparasitic on other pimplines. Many of the genera include species that have economic importance (Fitton *et al*., 1988).

They are small to large wasps with a dorsoventrally depressed metasoma, ample wings (Fig. 1a) and usually with a conspicuously exerted ovipositor (Gauld *et al*., 2002). Female pimpline wasps sometimes have an ovipositor longer than their

body. The ovipositor notch plays an important role in oviposition in members of the Ichneumonidae (Van Lenteren *et al*., 1998) (Figs. 1b, c).

Fig. 1. Pimplinae a. Fore wing, b. Ovipositor in lateral view, c. Tip part of ovipositor in lateral view.

Despite of its diversity and abundance as well as its interesting biology, the Ichneumonidae fauna in general and the Pimplinae fauna of Turkey are poorly studied. Up to 1995 (Kolarov, 1995), only 34 pimpline species belonging to 18 genera have been documented (Fahringer, 1922; Schimitschek, 1944; İren, 1952, 1960; Sedivy, 1959; Hedwig, 1959; Altay, 1966; Tuatay *et al*., 1972; Kasparyan, 1973,1981; Kavut *et al*., 1974; Constantineanu and Pisica, 1977; Soydanbay, 1978; Özdemir, 1981; Ulu, 1983; Önuçar and Zümreoğlu, 1985; Uzun, 1987; Kolarov, 1987; Işık *et al*., 1987; Özdemir and Kılınçer, 1990; Öncüer, 1991). After 1995, the numbers of Pimplinae fauna of Turkey reached to 100 species and 30 genera (Kolarov and Beyarslan, 1994; Kolarov *et al*., 1997a, 1997b, 1999, 2002, 2014; Yurtcan, 2004; Gürbüz, 2004, 2005; Gürbüz and Aksoylar, 2004; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan and Beyarslan, 2005, 2006; Çoruh *et al*., 2005, 2014a, 2014b; Yurtcan, 2007; Okyar and Yurtcan, 2007; Boncukcu, 2008, 2014; Kırtay, 2008; Çoruh and Tozlu, 2008; Çoruh and Özbek, 2008a, 2008b; Gürbüz *et al*., 2008, 2009a, 2009b, 2011; Birol, 2010; Eroğlu, 2010; Çoruh and Kolarov, 2010; Kolarov and Çalmaşur, 2011; Tozlu and Çoruh, 2011; Eroğlu *et al*., 2011; Özbek and Çoruh, 2012; Okyar *et al*., 2012).

The aim of this study is to evaluate the faunistic, ecological, zoogeographical features and host species collected from different localities in Turkey.

MATERIAL AND METHODS

The ichneumonid samples were carried out using traditional collecting methods (hand-netting, supplemented by sweeping; trapping, using Malaise and light traps; rearing; collected under stone) in different localities in Turkey in a two decades period.

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 properties, zoogeographical distributions, host species and plants visited by adults are provided in tables and graphs.

Finally, the homogeneity of the distribution of species among regions was compared using a Kurtosis analysis performed in SPSS 18.0 sofware.

RESULTS AND DISCUSSION

Pimplinae samples used in this study and added to the literature were collected in whole of Turkey in last two decade. Other ichneumonid and Pimplinae were evaluated in terms of different situations.

Faunistic Evaluations

So far, a total of 100 species of 30 genera in three tribes of Pimplinae were recognized in Turkey. In this study, 18 species and 8 genera belonging to tribe Polysphinctini, 42 species and 14 genera belonging to tribe Ephialtini, 40 species and 8 genera belonging to tribe Pimplini were recorded. So, Ephialtini species were found to be more abundant with their presence in seven different regions in Turkey (Fig. 2). Among the species determined, *Exeristes roborator* is the most abundant species, with 348 individuals collected. Then, *Pimpla spuria* (234), *Scambus nigricans* (118), *Pimpla contemplator* (162) and *P. rufipes* (157) were the most abundant in the research areas (Table 1).

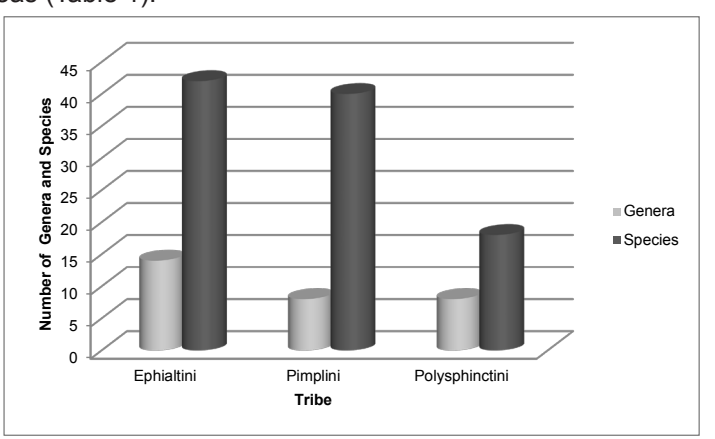

Fig. 2. Number of genera and species per tribe.

Table 1. Faunistic evaluations of Pimplinae 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).

Names of Taxa	IN	VD (meter)	SD	GR	ZR	HR	PVR	FRT
TRIBE: POLYSPHINCTINI HELLEN 1915								
***Acrodactyla* Holiday 1838**								
Acrodactyla carinator (Aubert, 1965)	1	B	JI	MR	E, EP, WP			Yurtcan and Beyarslan, 2005
Acrodactyla degener Holiday 1838	1	A	J	MR	E, EP, NEAR, WP			Yurtcan and Beyarslan, 2005
Acrodactyla medida Haliday, 1839	12	A, C	J, S	AR, MtR	E, EP, WP			Kolarov and Beyarslan, 1994
Acrodactyla quadrisculpta (Gravenhorst, 1820)	4	A, D, G	J, JI, S	BSR, CAR, EAR	AUR, E, EP, NEAR, ORR, WP			Yurtcan and Beyarslan, 2006
***Dreisbachia* Townes, 1962**								
Dreisbachia pictifrons (Thomson, 1877)	1	A	J	MR	E, EP, WP			Kolarov *et al*., 1997b
***Oxyrrhexis* Foerster 1868**								
Oxyrrhexis carbonatrix (Gravenhorst, 1807)	17	A, B, C, D, E, F, G	J, JI, A	CAR, EAR, MR, MtR	NEAR, PR			Özdemir and Kılınçer, 1990
***Polysphincta* Gravenhorst, 1829**								
Polysphincta boops Tschek, 1868	1	A	S	MR	E, EP, WP			Yurtcan and Beyarslan, 2005
Polysphincta rufipes Gravenhorst, 1829	2	A	JI	MR	E, EP, WP			Yurtcan and Beyarslan, 2005
Polysphincta tuberosa Gravenhorst, 1829	2	G	JI	EAR	E, EP, NEAR, WP			Kolarov *et al*., 1999
***Schizopyga* Gravenhorst, 1829**								
Schizopyga circulator (Panzer, 1800)	5	A, E, G	A, S	EAR, MR	E, EP, NEAR, WP			Kolarov *et al*., 1997a
Schizopyga frigida Cresson, 1870	1	A	S	MR	E, EP, NEAR, WP			Kolarov *et al*., 1997a
Schizopyga podagrica Gravenhorst, 1829	3	A, G	JI, S	AR, EAR	E, EP, WP			Kolarov *et al*., 2002
***Sinarachna* Townes, 1960**								
Sinarachna anomala (Holmgren, 1860)	2	A, C	JI	CAR, MR	E, EP, NEAR, NTR, WP			Constantineanu and Pisica, 1977
***Zabrachypus* Cushman, 1920**								
Zabrachypus primus Cushman, 1920	6	A, G, H	M, JI, A	EAR, MR, MtR	E, EP, NEAR, WP			Kolarov and Beyarslan, 1994
Zabrachypus tenuiabdominalis (Uchida 1941)	3	A	J	BSR, MR	EP, WP			Yurtcan and Beyarslan, 2006
***Zatypota* Foerster, 1868**								
Zatypota bohemani (Holmgren, 1860)	10	A, C, E, G	M, JI, A	CAR, EAR, MR, MtR	E, EP, WP			Kolarov, 1987
Zatypota gracilis (Holmgren, 1854)	1	A	JI	MR	E, EP, WP			Yurtcan and Beyarslan, 2005
Zatypota percontatoria Müller, 1776	6	D, G	J	EAR, MR, MtR	E, EP, NEAR, WP			Kolarov and Gürbüz, 2004

Table 1. Continued.

Names of Taxa	IN	VD (meter)	SD	GR	ZR	HR	PVR	FRT
TRIBE: EPHIALTINI HELLEN 1915								
***Acropimpla* Townes, 1960**								
Acropimpla didyma (Gravenhorst, 1829)	1	A	J	BSR	E, EP, WP	X		Işık *et al.*, 1987
Acropimpla pictipes Gravenhorst, 1829)	1	F	S	EAR	E, EP, WP			Çoruh, 2005
***Endromopoda* Hellen, 1939**								
Endromopoda arundinator (Fabricius, 1804)	15	A, F, H	M, J, Jl	AR, EAR, MR	E, EP, WP	X		Kolarov *et al.*, 1997b
Endromopoda detrita (Holmgren, 1860)	72	A, D, F, H	J, Jl, A, S	AR, BSR, EAR, MR, MtR	E, EP, NEAR, ORR, WP	X		Kolarov, 1987
Endromopoda phragmitidis (Perkins, 1957)	54	A, F, G	"Mr, Jl, A, S	EAR, MR, MtR	E, EP, WP	X		Kolarov and Beyarslan, 1994
***Ephialtes* Gravenhorst, 1829**								
Ephialtes manifestator Linnaeus, 1758	23	A, D, G	J, Jl	AR, EAR, MR, MtR	E, EP, NEAR, ORR, WP	X		Kolarov and Beyarslan, 1994
***Exeristes* Foerster, 1868**								
Exeristes arundinis Kriechbaumer, 1887	6	A, E	Jl, A	AR, EAR, MR	E, EP, WP			Kolarov *et al.*, 2002
Exeristes roborator Fabricius, 1973	348	A, B, C, D, E, F, G, H	A, M, J, Jl, AS	AR, BSR, CAR, EAR, MR, MtR, SAR	AFR, E, EP, ORR, WP	X		Fahringer, 1922
***Fredegunda* Fitton, Shaw and Gauld, 1988**								
Fredegunda diluta (Ratzeburg, 1852)	2	A	J	MtR	E, WP			Yurtcan, 2007
***Gregopimpla* Momoi, 1965**								
Gregopimpla bernuthii Hartig, 1838	1	A	S	MR	E, EP, WP			Kolarov *et al.*, 1997a
Gregopimpla inquisitor (Scopoli, 1763)	17	A, B, F, H	J, Jl	BSR, EAR, MR	E, EP, NEAR, WP	X		Çoruh, 2005
Gregopimpla malacosomae (Seyrig, 1827)	3	G	M, Jl	EAR, MtR	E, EP, WP	X		Çoruh, 2005
***Hybomischos* Baltazar, 1961**								
Hybomischos Stemcinctorius (Thunberg, 1822)	4	E, G	J, A	EAR	E, EP, NEAR, WP			Kolarov *et al.*, 1999
***Iseropus* Foerster, 1969**								
Iseropus stercorator (Fabricius, 1793)	20	C, G	J, Jl, A	EAR, MtR	E, EP, NEAR, WP			Kolarov *et al.*, 1999
***Liotryphon* Ashmead, 1900**								
Liotryphon caudatus (Ratzeburg, 1848)	4	D	J	CAR, MtR	E, EP, OCR, WP			Öncüer, 1991
Liotryphon crassiseta (Thomson, 1877)	2	F, G	Jl, A	CAR, EAR	E, EP, WP			Kolarov and Beyarslan, 1994
Liotryphon punctulatus (Ratzeburg, 1848)	2	D, E	M, A	EAR, MtR	E, EP, WP			Kolarov and Gürbüz, 2004

Table 1. Continued.

Names of Taxa	IN	VD (meter)	SD	GR	ZR	HR	PVR	FRT
TRIBE: EPHIALTINI HELLEN 1915								
***Paraperithous* Haupt, 1954**								
Paraperithous gnathaulax (Thomson, 1877)	7	D, E	Jl, A	EAR, MtR	E, EP, WP	X		Kolarov *et al*., 1999
***Perithous* Holmgren, 1859**								
Perithous divinator Rossi, 1790	19	A, D, G	M, Jl, Se, O	EAR, MR, MtR	E, EP, NEAR, ORR, WP			Kolarov, 1987
Perithous mediator Fabricius, 1804	1	A	Jl	MtR	E, EP			Kolarov and Beyarslan, 1994
Perithous romanicus Cons and Cons, 1968	1	A	A	MR	E, EP			Yurtcan, 2007
Perithous scurra Panzer, 1822	5	C, D	M, J, Jl, A, S	AR, CAR, EAR, MtR	E, EP, NEAR, WP			Özdemir and Kılınçer, 1990
Perithous Stemcinctorius (Thunberg, 1824)	3	G	J, Auğ	EAR	E, EP, NEAR, WP			Çoruh and Kolarov, 2010
***Scambus* Hartig, 1838**								
Scambus brevicornis (Gravenhorst, 1829)	70	A, C, D, E, H	M, J, S, O	BSR, CAR, EAR, MtR, MR	E, EP, NEAR, WP	X		Kolarov, 1987
Scambus buolianae (Hartig, 1838)	1	E	Jl	EAR	E, EP, WP			Çoruh and Kolarov, 2010
Scambus calobatus Gravenhorst, 1829	7	A, C, F	Jl, A, S	CAR, EAR, MR	E, EP, NEAR, WP	X		Özdemir and Kılınçer, 1990
Scambus elegans Woldstedit, 1877	4	A, D	J	AR, MR, MtR	E, WP	X		Soydanbay, 1978
Scambus foliae (Cushman, 1938)	3	A, E	J, Jl	AR, EAR, MR	E, EP, WP			Kolarov *et al*., 2002
Scambus nigricans (Thomson, 1877)	118	A, C, D, F, H	M, J, Jl, S	AR, EAR, MR, MtR	E, EP, WP	X		Kolarov and Beyarslan, 1994
Scambus planatus Hartig, 1838	5	D, H	M, J	EAR, MtR	E, EP, WP	X		Kolarov and Gürbüz, 2004
Scambus pomorum Ratzeburg, 1848	2	A, D	Jl	AR, MtR	E, WP	X		Önuçar and Zümreoğlu, 1985
Scambus rufator Aubert, 1963	2	A	S	MR	E, WP			Kasparyan, 1981
Scambus sagax Hartig, 1838	3	C, G, E	J, Jl	EAR	E, EP, WP	X		Çoruh, 2005
Scambus signatus Pfeffer, 1913	6	D, F	Jl	BSR, EAR	E, EP, WP			Çoruh *et al*., 2002
Scambus strobilorum Ratzeburg, 1848	1	G	Jl	EAR	E, EP, WP			Çoruh and Özbek, 2008b
Scambus vesicarius (Ratzeburg, 1844)	3	G, H	A, S	EAR	E, EP, NEAR, WP			Çoruh, 2005
***Tromatobia* Foerster, 1868**								
Tromatobia oculatoria (Fabricius, 1798)	9	A, D, G	J, Jl, S	EAR, MR, MtR	E, EP, WP			Kolarov *et al*., 1997a
Tromatobia ornata (Gravenhorst, 1829)	20	A, D, G	M, S, O	EAR, MtR	E, EP, ORR, WP	X		Gürbüz and Aksoylar, 2004
Tromatobia ovivora (Boheman, 1821)	5	A, F, H	J, Jl, S	BSR, EAR, MR	E, EP, NEAR, OCR, NTR, WP			Çoruh, 2005
Tromatobia variabilis (Holmgren, 1856)	14	A, F	J, Jl, S	CAR, EAR, MR, MtR	E, EP, NEAR, WP			Sedivy, 1959

Table 1. Continued.

Names of Taxa	IN	VD (meter)	SD	GR	ZR	HR	PVR	FRT
TRIBE: EPHIALTINI HELLEN 1915								
***Zaglyptus* Foerster, 1868**								
Zaglyptus multicolor (Gravenhorst, 1829)	16	A, B, C, D, G	J, JI, S	CAR, EAR, MR, MtR	E, EP, ORR, WP			Kolarov and Beyarslan, 1994
Zaglyptus varipes (Gravenhorst, 1829)	35	A, D, G	M, JI, A, S	AR, CAR, EAR, MR, MtR	E, EP, NEAR, WP			Özdemir and Kılınçer, 1990
TRIBE: PIMPLINI WESMAEL, 1845								
***Apechtis* Föerster, 1868**								
Apechtis compunctor Linnaeus, 1758	5	A, D	J, S	BSR, MR, MtR	E, EP, WP	X		Fahringer, 1922
Apechtis rufata (Gmelin, 1790)	3	B	JI	MR	E, EP, ORR, WP			Yurtcan and Beyarslan, 2005
Apechtis quadridentata (Thomson, 1877)	7	A, E	M, J	MR, MtR	E, EP, ORR, WP			Fahringer and Friese, 1921
***Clistopyga* Gravenhorst, 1829**								
Clistopyga canadensis Provancher, 1880	1	H	JI	EAR	E, NEAR, WP			Kolarov and Çalmaşur, 2011
Clistopyga rufator Holmgren, 1854	14	A, C, E, F, G	M, JI, A, O	EAR, MR, MtR	E, EP, WP			Yurtcan, 2004
***Delomerista* Foerster 1869**								
Delomerista mandibularis Gravenhorst, 1829	2	F	J	EAR	E, EP, NEAR, WP			Çoruh, 2005
Delomerista pfankuchi Brauns, 1905	1	D	M	CAR	E, EP, WP	X		Hedwig, 1959
***Dolichomitus* Smith, 1877**								
Dolichomitus dux (Tschek, 1868)	1	D	J	MtR	E, EP, WP			Kolarov and Gürbüz, 2004
*Dolichomitus mesocentrus (*Gravenhorst, 1829)	1	A	A	MR	E, EP, NEAR, WP			Fahringer, 1922
Dolichomitus messor (Gravenhorst, 1829)	1	A	J	MR	E, EP, NEAR, WP			Kolarov, 1987
Dolichomitus populneus (Ratzeburg, 1848)	11	D, F	J, JI, S	EAR, MtR	E, EP, NEAR, WP	X		Kolarov and Gürbüz, 2004
Dolichomitus sericeus (Hartig, 1847)	4	C	JI	CAR	E, EP, NEAR, WP	X		Özdemir and Kılınçer, 1990
Dolichomitus subglabratus (Perkins, 1943)	1	A	J	MR	E, EP, WP	X		Soydanbay, 1978
Dolichomitus tuberculatus Geoffroy, 1785	2	F	J, JI	EAR	E, EP, NEAR, ORR, WP	X		Çoruh, 2005
***Itoplectis* Foerster, 1868**								
Itoplectis alternans (Gravenhorst, 1829)	15	A, D, G, H	M, J	CAR, BSR, EAR, MR, MtR	E, EP, ORR, WP	X		Tuatay *et al*., 1972
Itoplectis aterrima Jussila, 1965	3	F, G	JI, A	EAR	E, EP, WP			Kolarov *et al.*, 1999
Itoplectis clavicornis Thomson, 1989	2	A	J	MR	E, EP, NEAR, WP	X		Okyar *et al*., 2012
Itoplectis maculator (Fabricius, 1775)	88	A, B, C, D, E, G, H	A, M, J, S	AR, BSR, CAR, EAR, MR, MtR	E, EP, WP	X		İren, 1952
Itoplectis melanocephala (Gravenhorst, 1829)	1	A	O	MR	AFR, E, EP, WP	X		Yurtcan and Beyarslan, 2005

Table 1. Continued.

Names of Taxa	IN	VD (meter)	SD	GR	ZR	HR	PVR	FRT
TRIBE: PIMPLINI WESMAEL, 1845								
Itoplectis tunetana (Schmiedeknecht, 1914)	19	A, C, G, E	J, Jl, S	CAR, EAR, MtR, MR	E, EP, WP	X		Aubert, 1969
Itoplectis viduata Gravenhorst, 1829	15	A, C, G, H	J, Jl, S	EAR	E, EP, NEAR, WP	X		Tuatay *et al*., 1972
***Pimpla* Fabricius, 1804**								
Pimpla aquilonia Cresson, 1870	15	A, B, F, H	J, Jl	BSR, EAR, MR	E, EP, NEAR, WP			Yurtcan and Beyarslan, 2005
Pimpla arcadica Kasparyan, 1973	12	F, G	J, A	EAR	E, EP, WP			Çoruh, 2005
Pimpla artemonis Kasparyan, 1973	20	A, D, F, G	M, J, Jl	BSR, EAR, MR, MtR	E, WP			Yurtcan, 2004
Pimpla caucasica Kasparyan, 1974	2	G, H	J, Jl	EAR	WP			Çoruh, 2005
Pimpla contemplator (Müller, 1776)	162	A, C, D, F, G	M, J, Jl	EAR, MR, MtR	E, EP, WP	X		Kolarov and Beyarslan, 1994
Pimpla coxalis Habermehl, 1917	1	F	S	EAR	E, WP			Çoruh, 2005
Pimpla hypochondriaca Retzius, 1783	85	A, D, F	J, A, S	CAR, EAR, MR, MtR	E, EP, WP	X	X	Fahringer and Frise, 1921
Pimpla illecebrator (Villers, 1789)	47	A, E, F, H	J, Jl	CAR, EAR, MR, MtR	E, EP, ORR, WP	X	X	Fahringer, 1922
Pimpla instigator Fabricius, 1793	3	D	J	CAR	E, EP, OCR, ORR, WP	X		Kansu, 1955
Pimpla insignatoria Gravenhorst, 1807	2	B, E	J, Jl	BSR, EAR	E, WP			Çoruh and Kolarov, 2010
Pimpla melanacrias Perkins, 1941	1	B	J	BSR	E, EP, OCR, ORR, WP			Çoruh *et al*., 2014a
Pimpla processioneae Ratzeburg, 1849	1	D	Jl	CAR	E, WP	X		Özdemir and Kılınçer, 1990
Pimpla rufipes Brullé, 1846	157	E, G, H	J, Jl	BSR, CAR, EAR	E, NTR, WP	X		Çoruh, 2005
Pimpla sodalis Ruthe, 1859	3	F, H	J, A	EAR	E, EP, NEAR, WP			Çoruh, 2005
Pimpla spuria Gravenhorst, 1829	234	A, C, D, F, H	M, J, Jl, A, S	AR, BSR, CAR, EAR, MR, MtR, SAR	E, EP, ORR, WP	X	X	Fahringer, 1922
Pimpla turionellae Linnaeus, 1758	27	A, C, D, G	M, J, Jl, S	CAR, EAR, MR, MtR	E, EP, OCR, ORR, WP	X	X	Fahringer, 1922
***Strongylopsis* Brauns, 1896**								
Strongylopsis abdominalis Kasparyan, 1974	7	D, G	M	MtR	E, WP			Gürbüz and Aksoylar, 2004
Strongylopsis belua Kuzin, 1950	14	G, H	J	EAR	EP, E, WP			Çoruh *et al*., 2002
***Theronia* Holmgren, 1859**								
Theronia atalantae atalantae (Poda, 1761)	1	C	J	CAR	E, EP, NEAR, ORR, WP	X		Fahringer, 1922

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): Mr: March, 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 Region, OCR: Oceanic Region, ORR: Oriental Region, WP: Western Palaearctic Region.

In contrast, *Acrodactyla carinator, A. degener*, *Dreisbachia pictifrons*, *Polysphincta boops*, *Schizopyga frigida*, *Zatypota gracilis*, *Acropimpla didyma*, *A. pictipes*, *Gregopimpla bernuthii*, *Perithous mediator*, *P. romanicus*, *Scambus buolianae*, *S. strobilorum*, *Clistopyga canadensis*, *Delomerista pfankuchi*, *Dolichomitus dux*, *D. mesocentrus*, *D. messor*, *D. subglabratus*, *Itoplectis melanocephala*, *Pimpla coxalis*, *P. melanacrias*, *P. processioneae* and *Theronia atalantae atalantae* (with 1 individual) were rarely found in Turkey (Table 1). Numbers of genera per tribe are shown in the graphs (Figs. 3, 4, 5).

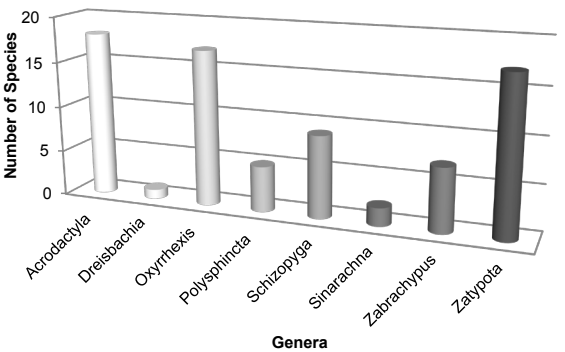

Fig. 3. Number of genera of the tribe Polysphinctini.

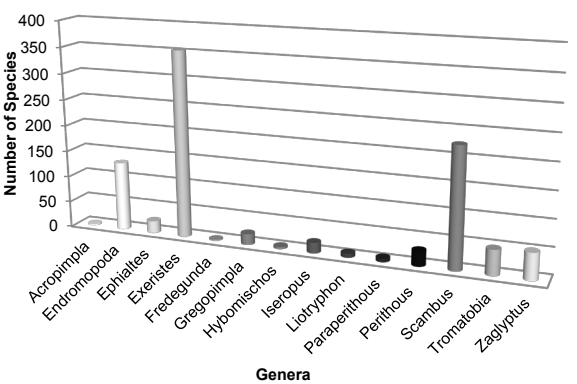

Fig. 4. Number of genera of the tribe Ephialtini.

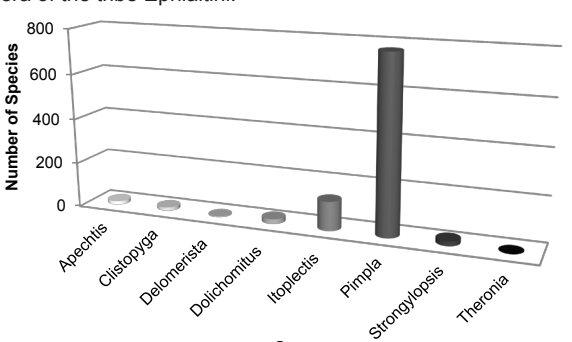

Fig. 5. Number of genera of the tribe Pimplini.

Most of pimplines were collected flowering plants. Besides, many species were caught by Malase and light traps. Interestingly, specimens of *Pimpla rufipes* were taken from under stones (Çoruh and Kesdek, 2008). This species was collected on March 29th, 2002, indicatingh that *P. rufipes* owerwinter as adult stage in protected places.

Ecological Evaluations

Pimpline specimens in this study were collected at different altitudes. These altitudes ranged from 0 m to 2500 m. Vertical distribution is an important parameter for ecological studies and this is interesting in terms of adaptation of species to altitude. As shown in Table 1, a total of 60 species were collected between 0-500 m, 10 species between 501-750 m, 21 species between 751-1000 m, 35 species between 1001-1250 m, 19 species between 1251-1500 m, 27 species between 1501-1750 m, 38 species between 1751-2000 m and 21 species between 2001-2500 m (Table 1).

Among them, 38 species were collected at only one altitude. *Itoplectis maculator* and *Oxyrrhexis carbonatrix* were collected at seven different altitudes, while *Exeristes roborator* was the only species collected at each altitude. More than 50% of all species were collected between 0-500 m altitudes (Fig. 6).

Considering seasonal dynamics of these species in Turkey, species were generally collected between March and October. This indicates that pimpline species are active during eight months of the year (Fig. 7). However, June, July and September had more dense populations (Table 1). As seen in table 1, *Endromopoda detrita*, *E. phragmitidis*, *Perithous divinator*, *Scambus brevicornis*, *S. nigricans*, *Zaglyptus varipes, Clistopyga rufator*, *Itoplectis maculator* and *Pimpla turionellae* were collected in four, *Pimpla spuria and Perithous scurra* were collected in five and *Exeristes roborator* were collected in six different months in a year.

With these results we can assert that, *Exeristes roborator* showed to be the most euryece species as it was collected at different altitudes and different climate conditions.

Zoogeographical Evaluations

Seven different regions in Turkey were investigated during the study (Table 1). As reported in the table 1, it is seen that, most of the samples (65) were collected from the Eastern Anatolia region and, 54, 43, 26, 18, 15, 2 species were collected from Marmara, Mediterranean, Central Anatolia, Black Sea, Aegean and Southeastern Anatolia region respectively (Fig. 9).

Table 2 shows for each species the province in the seven different regions where it was collected.

According to table 1 and 2, *Oxyrrhexis carbonatrix, Zatypota bohemani, Ephialtes manifestator, Perithous scurra*, *Scambus nigricans*, *Tromatobia variabilis, Zaglyptus multicolor*, *Itoplectis tunetana, Pimpla artemonis, P. hypochondriaca*, *P. illecebrator* and *P. turionellae* were collected from four different regions in Turkey. Also, *Endromopoda detrita, Scambus brevicornis*, *Zaglyptus varipes* and *Itoplectis alternans* were collected from five regions and *Itoplectis maculator* was collected from six regions. Moreover,

Pimpla spuria and *Exeristes roborator* were found in each collection area over Turkey and may be considered cosmopolitan species. However, 45 species of 100 species were collected from a single region.

When regions are compared, distributions are found homogeneous between regions, according to Kurtosis analysis (Fig. 8).

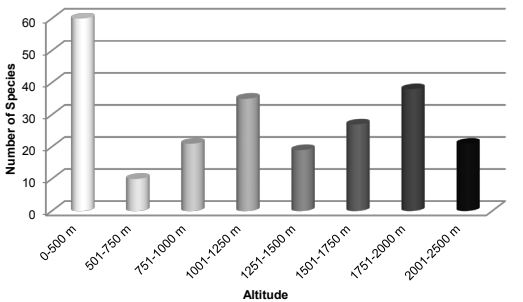

Fig. 6. Distribution of species according to altitude.

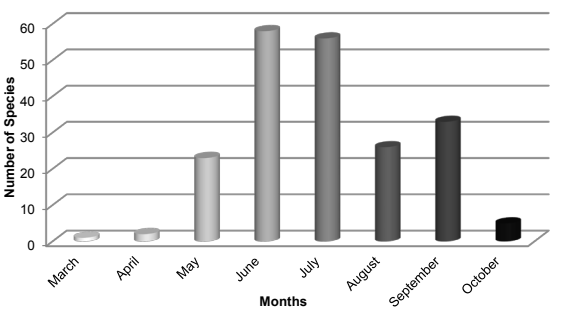

Fig. 7. Distribution of species according to months.

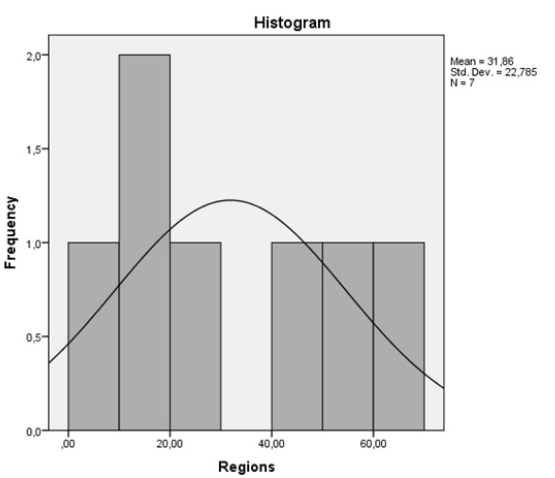

Fig. 8. Distribution of species according to regions of Turkey (Kurtosis analysis).

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

Names of Taxa	Distributions in Turkey (DT)	References (R)
TRIBE: POLYSPHINCTINI HELLEN 1915		
***Acrodactyla* Holiday 1838**		
Acrodactyla carinator (Aubert, 1965)	Kırklareli	Yurtcan and Beyarslan, 2005
Acrodactyla degener Holiday 1838	Çanakkale	Yurtcan and Beyarslan, 2005
Acrodactyla medida Haliday, 1839	Adana, Denizli, Kütahya, Uşak	Kolarov and Beyarslan, 1994; Kolarov *et al.*, 2002
Acrodactyla quadrisculpta (Gravenhorst, 1820)	Erzurum, Eskişehir, Zonguldak, Rize	Yurtcan and Beyarslan, 2006; Çoruh and Kolarov, 2010; Eroğlu *et al.*, 2011; Çoruh *et al.*, 2014a
***Dreisbachia* Townes, 1962**		
Dreisbachia pictifrons (Thomson, 1877)	Çanakkale	Kolarov *et al.*, 1997b
***Oxyrrhexis* Foerster 1868**		
Oxyrrhexis carbonator (Gravenhorst, 1807)	Ankara, Artvin, Bayburt, Çanakkale, Edirne, Erzurum, Eskişehir, Gümüşhane, İstanbul, Kars, Kırklareli, Konya, Nevşehir, Rize, Tekirdağ Yozgat	Özdemir and Kılınçer, 1990; Kolarov *et al.*, 1999; Yurtcan, 2004; Çoruh *et al.*, 2005; Eroğlu *et al.*, 2011
***Polysphincta* Gravenhorst, 1829**		
Polysphincta boops Tschek, 1868	Tekirdağ	Yurtcan and Beyarslan, 2005
Polysphincta rufipes Gravenhorst, 1829	Edirne, İstanbul	Yurtcan and Beyarslan, 2005
Polysphincta tuberosa Gravenhorst, 1829	Erzurum	Kolarov *et al.*, 1999; Çoruh, 2005
***Schizopyga* Gravenhorst, 1829**		
Schizopyga circulator (Panzer, 1800)	Bilecik, Erzurum, Kırklareli, Tekirdağ	Kolarov *et al.*, 1997a; Yurtcan and Beyarslan, 2005; Çoruh and Kolarov, 2010
Schizopyga frigida Cresson, 1870	Bilecik	Kolarov *et al.*, 1997a
Schizopyga podagrica Gravenhorst, 1829	Aydın, Erzurum	Kolarov *et al.*, 2002; Çoruh, 2005; Çoruh and Kolarov, 2010
***Sinarachna* Townes, 1960**		
Sinarachna anomala (Holmgren,1860)	Anatolia, İstanbul	Constantineanu and Pisica, 1977; Kolarov, 1995
***Zabrachypus* Cushman, 1920**		
Zabrachypus primus Cushman, 1920	Adana, Antalya, Edirne, Erzurum, Kırklareli, Tunceli	Kolarov and Beyarslan, 1994; Çoruh, 2005; Yurtcan and Beyarslan, 2005; Kolarov and Çalmaşur, 2011; Kolarov *et al.*, 2014
Zabrachypus tenuiabdominalis (Uchida, 1941)	Bartın, Bolu, Kastamonu	Yurtcan and Beyarslan, 2006
***Zatypota* Foerster, 1868**		
Zatypota bohemani (Holmgren, 1860)	Adana, Edirne, Elazığ, Erzurum, Hatay, İçel, Isparta, İstanbul, Kars, Osmaniye	Kolarov, 1987; Kolarov and Beyarslan, 1994; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan and Beyarslan, 2005; Çoruh and Kolarov, 2010; Gürbüz *et al.*, 2012; Boncukcu, 2014
Zatypota gracilis (Holmgren, 1854)	Kırklareli	Yurtcan and Beyarslan, 2005
Zatypota percontatoria Müller, 1776	Bolu, Erzurum, Isparta, Kastamonu	Kolarov and Gürbüz, 2004; Yurtcan and Beyarslan, 2006; Çoruh and Özbek, 2008b; Birol, 2010

Table 2. Continued.

Names of Taxa	Distributions in Turkey (DT)	References (R)
TRIBE: EPHIALTINI HELLEN 1915		
***Acropimpla* Townes, 1960**		
Acropimpla didyma (Gravenhorst, 1829)	Eastern Black Sea	Işık *et al*., 1987; Öncüer,1991; Kolarov, 1995
Acropimpla pictipes (Gravenhorst, 1829)	Erzurum	Çoruh, 2005
***Endromopoda* Hellen, 1939**		
Endromopoda arundinator (Fabricius, 1804)	Çanakkale, Edirne, Erzurum, Isparta, Kars, İzmir, Manisa, Tekirdağ	Kolarov *et al*., 1997b, 2002; Yurtcan, 2004, 2007; Çoruh, 2005; Gürbüz *et al*., 2009a
Endromopoda detrita (Holmgren, 1860)	Afyon, Bayburt, Burdur, Bursa, Çanakkale, Denizli, Edirne, Erzincan, Erzurum, Gümüşhane, Iğdır, Isparta, İstanbul, İzmir, Kars, Kırklareli, Rize, Tekirdağ, Tunceli	Kolarov, 1987; Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov and Beyarslan, 1994; Kolarov, 1995; Kolarov *et al*., 1997a, b, 1999, 2002, 2014; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010
Endromopoda phragmitidis (Perkins, 1957)	Balıkesir, Bayburt, Bingöl, Çanakkale, Edirne, Erzurum, Iğdır, Isparta, İstanbul, Kars, Kırklareli, Tekirdağ, Van	Kolarov and Beyarslan, 1994; Kolarov *et al*., 1997a, b, 1999; Gürbüz, 2004, 2005; Çoruh, 2005; Yurtcan, 2007
***Ephialtes* Gravenhorst, 1829**		
Ephialtes manifestator Linnaeus, 1758	Denizli, Elazığ, Erzurum, Isparta, Kırklareli, Kütahya, Manisa, Uşak	Kolarov and Beyarslan, 1994; Kolarov *et al*., 2002; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010
***Exeristes* Foerster, 1868**		
Exeristes arundinis Kriechbaumer, 1887	Denizli, Erzincan, Erzurum, Tekirdağ	Kolarov *et al*., 2002; Çoruh, 2005; Yurtcan, 2007
Exeristes roborator Fabricius, 1973	Ankara, Ardahan, Artvin, Balıkesir, Bayburt, Bilecik, Bingöl, Bitlis, Burdur; Bursa, Çanakkale, Denizli, Edirne, Erzurum, Erzincan, Gümüşhane, Hakkari, Isparta, İstanbul, İçel, Kars, Kırklareli, Muğla, Muş, Rize, Tekirdağ, Tunceli	Fahringer, 1922, Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov and Beyarslan, 1994; Kolarov, 1995; Kolarov *et al*., 1997a, b, 1999, 2002, 2014; Kasparyan and Gültekin, 2002; Gürbüz, 2004; Kolarov and Gürbüz, 2004; Gürbüz, 2005; Çoruh, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010; Tozlu and Çoruh 2011; Özbek and Çoruh, 2012
***Fredegunda* Fitton, Shaw and Gauld, 1988**		
Fredegunda diluta (Ratzeburg, 1852)	İstanbul, Tekirdağ	Yurtcan, 2007
***Gregopimpla* Momoi, 1965**		
Gregopimpla bernuthii Hartig, 1838	Çanakkale	Kolarov *et al*., 1997a
Gregopimpla inquisitor (Scopoli, 1763)	Edirne, Erzurum, Kırklareli, Rize,Tekirdağ	Çoruh, 2005; Yurtcan, 2007; Çoruh *et al*., 2014a
Gregopimpla malacosomae (Seyrig, 1827)	Erzurum, Isparta	Çoruh, 2005; Birol, 2010
***Hybomischos* Baltazar, 1961**		
Hybomischos septemcinctorius (Thunberg, 1822)	Bingöl, Ezurum, Isparta	Kolarov *et al*., 1999; Kolarov and Gürbüz, 2004; Çoruh, 2005
***Iseropus* Foerster, 1969**		
Iseropus stercorator (Fabricius, 1793)	Erzurum, Isparta	Kolarov *et al*., 1999; Çoruh, 2005; Boncukcu, 2014

Table 2. Continued.

Names of Taxa	Distributions in Turkey (DT)	References (R)
TRIBE: EPHIALTINI HELLEN 1915		
***Liotryphon* Ashmead, 1900**		
Liotryphon caudatus (Ratzeburg, 1848)	Anatolia, Isparta	Öncüer, 1991; Kolarov,1995; Kolarov and Gürbüz, 2004; Gürbüz, 2005
Liotryphon crassiseta (Thomson, 1877)	Erzurum, Konya	Kolarov and Beyarslan, 1994; Çoruh, 2005
Liotryphon punctulatus (Ratzeburg, 1848)	Erzurum, Isparta	Kolarov and Gürbüz, 2004; Çoruh and Kolarov, 2010
***Paraperithous* Haupt, 1954**		
Paraperithous gnathaulax (Thomson, 1877)	Erzurum, Isparta, Kars	Kolarov *et al*., 1999; Çoruh, 2005; Çoruh and Kolarov, 2010; Kolarov and Çalmaşur, 2011
***Perithous* Holmgren, 1859**		
Perithous divinator Rossi, 1790	Bursa, Çanakkale, Edirne, Erzurum, Isparta, Tekirdağ	Kolarov, 1987, 1995; Kolarov *et al*.,1997a, b, 1999; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010
Perithous mediator Fabricius, 1804	Antalya	Kolarov and Beyarslan, 1994
Perithous romanicus Cons and Cons, 1968	Tekirdağ	Yurtcan, 2007
Perithous scurra Panzer, 1822	Afyon, Ankara, Erzurum, Isparta	Özdemir and Kılınçer, 1990; Kolarov, 1995; Kolarov *et al*., 2002; Çoruh, 2005; Boncukcu, 2014
Perithous septemcinctorius (Thunberg, 1824)	Erzurum, Tunceli	Çoruh and Kolarov, 2010; Kolarov *et al*., 2014
***Scambus* Hartig, 1838**		
Scambus brevicornis (Gravenhorst, 1829)	Ankara, Artvin, Bingöl, Bitlis, Edirne, Erzurum, Isparta, İstanbul, Kırklareli, Kars, Rize, Tekirdağ	Kolarov, 1987, 1995; Özdemir and Kılınçer, 1990; Kolarov and Beyarslan, 1994; Kolarov *et al*., 1999; Özdemir and Özdemir, 2002; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan, 2007; Çoruh *et al*., 2007; Çoruh and Kolarov, 2010
Scambus buolianae (Hartig, 1838)	Erzurum	Çoruh and Kolarov, 2010
Scambus calobatus Gravenhorst, 1829	Ankara, Edirne, Erzurum, İstanbul	Özdemir and Kılınçer, 1990; Kolarov, 1995; Kolarov *et al*., 1999; Özdemir and Özdemir, 2002; Çoruh, 2005; Yurtcan, 2007
Scambus elegans Woldstedit, 1877	Bursa, Çanakkale, Isparta, İzmir	Soydanbay, 1978; Öncüer, 1991; Kolarov, 1995; Kolarov and Gürbüz, 2004; Yurtcan, 2007
Scambus foliae (Cushman, 1938)	Erzurum, Manisa, Tekirdağ	Kolarov *et al*., 2002; Çoruh, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010
Scambus nigricans (Thomson, 1877)	Afyon, Artvin, Balıkesir, Bayburt, Burdur, Bursa, Çanakkale, Denizli, Edirne, Erzincan, Erzurum, Isparta, İstanbul, İzmir, Kahramanmaraş, Kars, Kırklareli, Tekirdağ	Kolarov and Beyarslan, 1994; Kolarov *et al*., 1997a, 1999, 2002; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan, 2007; Çoruh *et al*., 2007; Çoruh and Kolarov, 2010; Kolarov and Çalmaşur, 2011
Scambus planatus Hartig, 1838	Bayburt, Erzurum, Isparta	Kolarov and Gürbüz, 2004; Çoruh, 2005
Scambus pomorum Ratzeburg, 1848	Burdur, İzmir	Önuçar and Zümreoğlu, 1985; Öncüer, 1991; Kolarov, 1995; Kolarov and Gürbüz, 2004
Scambus rufator Aubert, 1963	Kırklareli	Kasparyan, 1981; Kolarov, 1995; Yurtcan, 2007
Scambus sagax Hartig, 1838	Bayburt, Iğdır, Kars	Çoruh, 2005; Çoruh and Tozlu, 2008; Çoruh and Kolarov, 2010
Scambus signatus Pfeffer, 1913	Erzincan, Erzurum, Rize	Çoruh *et al*., 2002; Çoruh, 2005; Çoruh and Kolarov, 2010
Scambus strobilorum Ratzeburg, 1848	Artvin	Çoruh and Özbek, 2008b
Scambus vesicarius (Ratzeburg, 1844)	Erzurum	Çoruh, 2005

Table 2. Continued.

Names of Taxa	Distributions in Turkey (DT)	References (R)
TRIBE: EPHIALTINI HELLEN 1915		
***Tromatobia* Foerster, 1868**		
Tromatobia oculatoria (Fabricius, 1798)	Bilecik, Erzurum, Isparta	Kolarov *et al*., 1997a, 1999; Kolarov and Gürbüz, 2004; Gürbüz, 2005; Çoruh, 2005
Tromatobia ornata (Gravenhorst, 1829)	Edirne, Erzurum, Isparta, Kars, Kırklareli, Tekirdağ, Tunceli	Gürbüz and Aksoylar, 2004; Gürbüz, 2004, 2005; Çoruh, 2005; Yurtcan, 2007; Çoruh *et al*., 2007; Çoruh and Kolarov, 2010; Kolarov and Çalmaşur, 2001; Kolarov *et al*., 2014
Tromatobia ovivora (Boheman, 1821)	Erzurum, Kars, Kırklareli, Rize	Çoruh, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010
Tromatobia variabilis (Holmgren,1856)	Adana, Ankara, Edirne, Erzurum, Isparta, İstanbul, Kars, Kırklareli, Tekirdağ	Sedivy, 1959; Öncüer, 1991; Kolarov and Beyarslan, 1994; Kolarov, 1995; Gürbüz, 2004, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010; Kolarov and Çalmaşur, 2011
***Zaglyptus* Foerster, 1868**		
Zaglyptus multicolor (Gravenhorst, 1829)	Adana, Adıyaman, Edirne, Elazığ, Erzurum, Eskişehir, Isparta, Kars, Kırklareli, Tekirdağ	Kolarov and Beyarslan, 1994; Kolarov and Gürbüz, 2005; Çoruh, 2005; Yurtcan, 2007; Çoruh *et al*., 2007; Boncukcu, 2008; Eroğlu *et al*., 2011
Zaglyptus varipes (Gravenhorst, 1829)	Ankara, Artvin, Balıkesir, Bilecik, Bursa, Denizli, Edirne, Isparta, Kars, Kırklareli, Tekirdağ	Özdemir and Kılınçer, 1990; Kolarov and Beyarslan, 1994; Kolarov *et al*., 1997a, 2002; Gürbüz, 2004, 2005; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010
TRIBE: PIMPLINI WESMAEL,1845		
***Apechtis* Föerster, 1868**		
Apechtis compunctor Linnaeus,1758	Bursa, Çanakkale, Isparta, Rize	Fahringer, 1922; Kolarov, 1995; Kolarov *et al*., 1997a; Kolarov and Gürbüz 2004; Çoruh *et al*., 2014a
Apechtis rufata (Gmelin, 1790)	Kırklareli	Yurtcan and Beyarslan, 2005
Apechtis quadridentata (Thomson, 1877)	Edirne, Hatay, İstanbul, Kırklareli, Tekirdağ	Fahringer and Friese, 1921; Kolarov, 1995, 1997; Yurtcan and Beyarslan, 2005
***Clistopyga* Gravenhorst, 1829**		
Clistopyga canadensis Provancher, 1880	Erzurum	Kolarov and Çalmaşur, 2011
Clistopyga rufator Holmgren, 1854	Adana, Edirne, Erzurum, Hatay, Isparta, Kars, Kırklareli	Yurtcan, 2004, 2007; Çoruh, 2005; Çoruh *et al*., 2007; Boncukcu, 2008; Gürbüz *et al*., 2008; Çoruh and Kolarov, 2010; Birol, 2010; Boncukcu, 2014
***Delomerista* Foerster, 1969**		
Delomerista mandibularis Gravenhorst, 1829	Bingöl	Çoruh, 2005, Çoruh *et al*., 2007
Delomerista pfankuchi Brauns, 1905	Anatolia	Hedwig, 1959; Kolarov, 1995
***Dolichomitus* Smith, 1877**		
Dolichomitus dux (Tschek,1868)	Isparta	Kolarov and Gürbüz, 2004
*Dolichomitus mesocentrus (*Gravenhorst, 1829)	İstanbul	Fahringer, 1922
Dolichomitus messor (Gravenhorst, 1829)	İstanbul	Kolarov, 1987, 1995; Öncüer,1991
Dolichomitus populneus (Ratzeburg, 1848)	Isparta, Kars	Kolarov and Gürbüz, 2004; Çoruh, 2005; Çoruh and Kolarov, 2010

Table 2. Continued.

Names of Taxa	Distributions in Turkey (DT)	References (R)
TRIBE: EPHIALTINI HELLEN 1915		
***Dolichomitus* Smith, 1877**		
Dolichomitus sericeus (Hartig, 1847)	Ankara, Kırşehir	Özdemir and Kılınçer, 1990; Kolarov, 1995
Dolichomitus subglabratus (Perkins, 1943)	Bursa	Soydanbay, 1978; Kolarov,1995
Dolichomitus tuberculatus Geoffroy, 1785	Erzurum, Kars	Çoruh, 2005
***Itoplectis* Foerster, 1868**		
Itoplectis alternans (Gravenhorst, 1829)	Ankara, Bingöl, Bolu, Edirne, Erzurum, East Black Sea, Çorum, Isparta, İstanbul, Kastamonu, Kırklareli, Ordu, Sinop, Zonguldak	Tuatay *et al*., 1972, Soydanbay, 1978; Işık *et al*., 1987; Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov and Beyarslan, 1994; Kolarov, 1995; Gürbüz, 2004, 2005; Yurtcan, 2004; Çoruh, 2005; Yurtcan and Beyarslan, 2005; Okyar and Yurtcan, 2007; Gürbüz *et al.*, 2009; Kolarov and Çalmaşur, 2011
Itoplectis aterrima Jussila, 1965	Erzurum	Kolarov *et al*., 1999; Çoruh, 2005
Itoplectis clavicornis Thomson, 1989	Edirne	Okyar *et al*., 2012
Itoplectis maculator (Fabricius, 1775)	Adana, Ankara, Afyon, Artvin, Balıkesir, Bitlis, Bolu, Çanakkale, Çorum, Denizli, Edirne, Eskişehir, Erzurum, Gümüşhane, Isparta, İçel, İzmir, Kars, Kastamonu, Kırklareli, Kırşehir, Konya, Nevşehir, Niğde, Muğla, Rize, Sinop, Tekirdağ, Van, Yozgat, Zonguldak	İren, 1952, 1960, 1977; Doğanlar, 1987, Kasparyan, 1973, 1974; Ulu, 1983; Kansu *et al*., 1986; Kolarov, 1987; Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov and Beyarslan, 1994; Erol and Yaşar, 1996; Kolarov, 1995; Kolarov *et al*., 1997b, 1999, 2002; Özdemir and Özdemir, 2002, Gürbüz, 2004; Kolarov and Gürbüz, 2004; Yurtcan and Beyarslan, 2005; Çoruh, 2005; Gürbüz, 2005; Okyar and Yurtcan, 2007; Çoruh *et al*., 2007, 2014a; Gürbüz *et al*., 2009; Çoruh and Kolarov, 2010; Birol, 2010; Eroğlu *et al*., 2011
Itoplectis melanocephala (Gravenhorst, 1829)	Edirne	Yurtcan and Beyarslan, 2005
Itoplectis tunetana (Schmiedeknecht, 1914)	Anatolia, Adıyaman, Ankara, Bursa, Çanakkale, Erzurum, İstanbul, Kars, Kırklareli, Konya, Nevşehir, Tekirdağ, Tunceli, Sivas	Aubert, 1969; Kolarov, 1987, 1995; Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov and Beyarslan, 1994; Kolarov *et al*., 1997a, b, 1999, 2014; Gencer, 2003; Yurtcan and Beyarslan, 2005; Çoruh, 2005; Çoruh *et al*., 2007; Çoruh and Kolarov, 2010
Itoplectis viduata Gravenhorst, 1829	Bitlis, Erzurum, Iğdır, Kars	Tuatay *et al*., 1972; Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov, 1995; Özdemir and Özdemir, 2002; Çoruh, 2005; Çoruh and Kolarov, 2010
***Pimpla* Fabricius, 1804**		
Pimpla aquilonia Cresson, 1870	Ardahan, Artvin, Erzurum, Kars, Kırklareli, Rize, Tekirdağ	Yurtcan and Beyarslan, 2005; Çoruh and Kolarov, 2010; Çoruh *et al*., 2014a
Pimpla arcadica Kasparyan, 1973	Erzurum, Kars	Çoruh, 2005; Çoruh *et al*., 2007; Çoruh and Kolarov, 2010
Pimpla artemonis Kasparyan, 1973	Artvin, Bayburt, Edirne, Erzurum, Isparta, İstanbul, Kars,Rize	Yurtcan, 2004; Çoruh, 2005; Çoruh and Kolarov, 2010; Boncukcu, 2014
Pimpla caucasica Kasparyan, 1974	Erzurum	Çoruh, 2005
Pimpla contemplator (Müller, 1776)	Antalya, Edirne, Erzurum, Isparta, İstanbul, Kırklareli, Tekirdağ	Kolarov and Beyarslan, 1994; Kolarov *et al*.,1999; Kolarov and Gürbüz, 2004; Yurtcan and Beyaslan, 2005; Çoruh, 2005; Çoruh and Kolarov, 2010
Pimpla coxalis Habermehl, 1917	Kars	Çoruh, 2005

Table 2. Continued.

Names of Taxa	Distributions in Turkey (DT)	References (R)
TRIBE: EPHIALTINI HELLEN 1915		
***Pimpla* Fabricius, 1804**		
Pimpla hypochondriaca Retzius, 1783	Anatolia, Ankara, Bayburt, Bingöl, Bursa, Çanakkale, Edirne, Erzurum, Konya, Iğdır, Isparta, İçel, İstanbul, İzmir, Nevşehir, Niğde, Tekirdağ	Fahringer and Frise, 1921; Fahringer, 1922; Kansu, 1955; Altay, 1966; Soydanbay, 1978; Uzun, 1987; Özdemir and Kılınçer, 1990; Kolarov *et al*.,1997a, 1999; Kolarov and Gürbüz, 2004; Gürbüz, 2005; Çoruh, 2005
Pimpla illecebrator (Villers, 1789)	Ankara, Artvin, Bayburt, Çanakkale, Erzurum, İçel, Kars, Konya, Niğde	Fahringer, 1922; Sedivy, 1959; Tuatay *et al*., 1972; Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov *et al*., 1997b, 1999; Kolarov, 1995; Çoruh, 2005; Çoruh and Kolarov, 2010
Pimpla instigator Fabricius, 1793	Anatolia	Kansu, 1955
Pimpla insignatoria Gravenhorst, 1807	Erzurum, Trabzon	Çoruh and Kolarov, 2010; Çoruh *et al*., 2014a
Pimpla melanacrias Perkins, 1941	Rize	Çoruh *et al*., 2014a
Pimpla processioneae Ratzeburg, 1849	Anatolia	Özdemir and Kılınçer, 1990
Pimpla rufipes Brullé, 1846	Bayburt, Bolu, Çorum, Erzurum, Iğdır, Kars, Kastamonu, Zonguldak	Çoruh, 2005; Okyar and Yurtcan, 2007; Kolarov and Çalmaşur, 2011
Pimpla sodalis Ruthe, 1859	Erzurum, Kars	Çoruh, 2005
Pimpla spuria Gravenhorst, 1829	Adana, Adıyaman, Afyon, Ankara, Artvin, Balıkesir, Bilecik, Black Sea, Bursa, Çanakkale, Denizli, Edirne, Erzincan, Erzurum, Eskişehir, Giresun, Gaziantep, Hatay, Isparta, İstanbul, İçel, İzmit, Kars, Kırklareli, Konya, Manisa, Muğla, Rize, Şanlıurfa, Tekirdağ, Trabzon, Tunceli,Uşak	Fahringer, 1922; Özdemir, 1981, Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov and Beyarslan, 1994; Kolarov *et al*.,1997a, b, 1999, 2002, 2014; Gürbüz, 2004, 2005; Kolarov and Gürbüz, 2004; Çoruh, 2005; Kırtay, 2008; Çoruh and Kolarov, 2010; Eroğlu *et al*., 2011; Çoruh *et al*., 2014a
Pimpla turionellae Linnaeus, 1758	Ankara, Bursa, Erzurum, Eskişehir, Isparta, İstanbul, Kırklareli, Kırşehir, Konya, Nevşehir, Niğde, Van	Fahringer, 1922; İren, 1952, 1960; Soydanbay, 1978; Uğur, 1985; Kansu *et al*., 1986; Özdemir and Kılınçer, 1990; Öncüer, 1991; Erol and Yaşar, 1996; Özdemir and Özdemir, 2002; Gürbüz, 2004, 2005; Kolarov and Gürbüz, 2004; Çoruh, 2005; Kırtay, 2008; Birol, 2010; Gürbüz *et al*., 2009b; Boncukcu, 2014
***Strongylopsis* Brauns, 1896**		
Strongylopsis abdominalis Kasparyan, 1974	Isparta	Gürbüz and Aksoylar, 2004; Kolarov and Gürbüz, 2004; Gürbüz, 2005
Strongylopsis belua Kuzin, 1950	Erzurum	Çoruh *et al*., 2002; Çoruh, 2005; Çoruh and Kolarov, 2010; Çoruh and Özbek, 2011; Kolarov and Çalmaşur, 2011
***Theronia* Holmgren, 1859**		
Theronia atalantae atalantae (Poda, 1761)	Ankara, Konya, Nevşehir, Niğde,	Fahringer, 1922; Schimitschek, 1944; Anoymous, 1971, Tuatay *et al*., 1972, Kolarov, 1995

The zoogeographical characterization is based on the chorotype classification of the Near East fauna, which was proposed by Vigna Taglianti *et al*. (1999). The geographical distribution of the species that mentioned above can be divided into the following groups: 97 species have Western Palaearctic distribution, 97 species European, 87 species East Palaearctic, 35 species Nearctic, 17 species Oriental, five species Oceanic, three species Neotropical, two species Afrotropical and one species

Australian. According to these results, Western Palaearctic and European have the highest numbers of species (Fig. 10, Table 1). Among this 100 species, *Sinarachna anomala, Endromopoda detrita, Ephialtes manifestator*, *Exeristes roborator*, *Perithous divinator*, *Dolichomitus tuberculatus*, *Pimpla instigator*, *P. melanacrias*, *P. turionellae* and *Theronia atalantae atalantae* showed distribution in five different regions. Similarly, *Acrodactyla quadrisculpta* and *Tromatobia ovivora* showed distribution in six different zoogeographical regions. This wide range of distribution is due to rich host availability together with their eurytolerant nature (Kasparyan, 1981; Yu *et al*., 2005). Also, among them, *Pimpla caucasica* has a distribution area limited to a single zoogeographical regions.

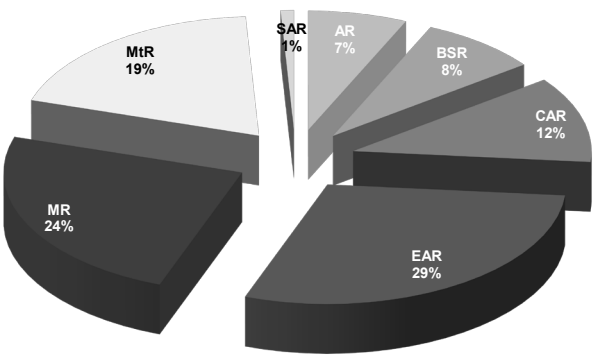

Fig. 9. Distribution of species according to regions of Turkey. AR: Aegean Region, BSR: Black Sea Region, CAR: Central Anatolia Region, EAR: Eastern Anatolia Region, MR: Marmara Region, MtR: Mediterranean Region, SAR: Southeastern Anatolia.

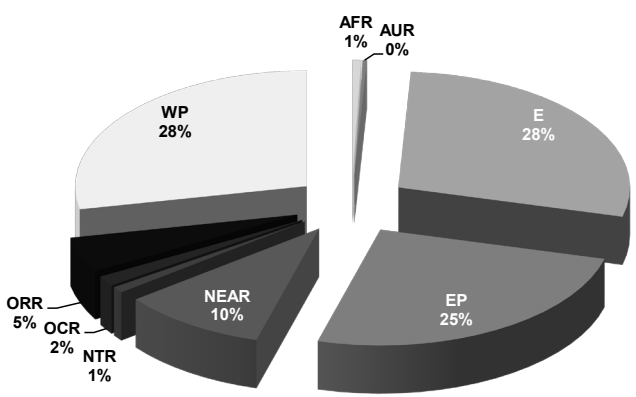

Fig. 10. Distribution of species according to zoogeographical regions. AFR: Afrortopikal Region, AUR: Australian Region, E: Europe, EP: Eastern Palaearctic, NEAR: Nearctic Region, NTR: Neotropikal Region, OCR: Oceanic Region, ORR: Oriental Region, WP: Western Palaearctic.

Evaluations of host and plant visited by adults

Most of the reared parasitic Hymenoptera showed to be parasitoids of caterpillars (Kot, 2007). The subfamily Pimplinae is moderately species-rich in almost all terrestrial

habitats but, unlike many other groups of Ichneumonidae (Owen and Owen, 1974; Janzen, 1981), it is more species-rich in equatorial than in temperate regions (Gauld, 1986, 1991). The Pimplinae have a particular biological interest because shows a greater variety of host interactions than almost any other subfamily of Ichneumonidae. Some species are idiobionts, others koinobionts. They may develop ectoparasitically, or endoparasitically, solitarily or gregariously, and whilst most species are carnivorous, incipient phytophagy is believed to occur in some taxa (Gauld *et al*., 2002).

A total of 38 pimpline species were reared from different hosts in Turkey (Table 3). Most of these hosts belong to Lepidoptera order, followed by Coleoptera, Diptera and Homoptera. Only one pimpline species was obtained from an Hymenoptera. According to these results, *Itoplectis maculator* was obtained from 15 different hosts. Following that, *Exeristes roborator Pimpla turionellae* and *Pimpla hypochondriaca* were obtained from 13, 10 and 8 hosts respectively.

These results also confirm that, *I. maculator* is a potential biological control agent in the world.

Several plant species have been recorded as associated host plants for ichneumonid species (Yu *et al*., 2005), Table 4 showed the pimpline species associated with plant species in Turkey. So far, 5 species of all species have been identified as plants visited by pimpline adults. It appears from field studies, *Pimpla hypochondriaca* was visited four different plants. Besides, *Pimpla turionellae* is attracted by flowers of *Heracleum* sp.

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

Names of Taxa	Hosts Name (HN)	Order and Family of Hosts (OFH)	References
TRIBE: EPHIALTINI HELLEN 1915			
***Acropimpla* Townes, 1960**			
Acropimpla didyma Gravenhorst, 1829	*Gypsonoma dealbana*	Lepidoptera: Tortricidae	Öncüer, 1991
***Endromopoda* Hellen, 1939**			
Endromopoda arundinator (Fabricius, 1804)	*Platycephala* sp.	Diptera: Chloropidae	Yurtcan, 2004
Endromopoda detrita (Holmgren, 1860)	*Archips rosana*	Lepidoptera: Tortricidae	Çoruh and Özbek, 2008a
Endromopoda phragmitidis (Perkins, 1957)	*Malacosoma neustria*	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
***Ephialtes* Gravenhorst, 1829**			
Ephialtes manifestator Linnaeus, 1758	*Bembecia scopigera*	Lepidoptera: Sesiidae	Çoruh and Özbek, 2008a
***Exeristes* Foerster, 1868**			
Exeristes roborator Fabricius, 1973	*Lixus bardanae*	Coleoptera: Curculionidae	Gültekin *et al*., 2004; Çoruh and Özbek, 2008a
	Malacosoma neustria	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a; Özbek and Çoruh, 2012
	Malacosoma franconica	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
	Rhyaciona pinicolona	Lepidoptera: Tortricidae	Yıldırım *et al*., 1999; Çoruh and Özbek, 2008a

Table 3. Continued.

Names of Taxa	Hosts Name (HN)	Order and Family of Hosts (OFH)	References
TRIBE: EPHIALTINI HELLEN 1915			
***Exeristes* Foerster, 1868**			
Exeristes roborator Fabricius, 1973	*Diplolepis fructuum*	Hymenoptera: Cynipidae	Özbek *et al*., 1999; Çoruh *et al*., 2014a; Çoruh and Özbek, 2008a
	Cynaeda gigantea	Lepidoptera: Crambidae	Tozlu and Çoruh, 2011
	Aporia sp.	Lepidoptera: Pieridae	Tuatay *et al*., 1972; Kavut *et al*., 1974
	Pectinophora gossypiella	Lepidoptera: Galechiidae	Tuatay *et al*., 1972
	Rhinonocyllus conicus	Coleoptera: Curculionidae	Kasparyan and Gültekin, 2002
	Larinus latus	Coleoptera: Curculionidae	Kasparyan and Gültekin, 2002; Gültekin *et al*., 2003; Gültekin, 2008
	Larinus onopordi	Coleoptera: Curculionidae	Kasparyan and Gültekin, 2002
	Larinus filiformis	Coleoptera: Curculionidae	Gültekin *et al*., 2008a,b
	Homoesoma nebulella	Lepidoptera: Pyralidae	Özdemir and Kılınçer, 1990
***Gregopimpla* Momoi, 1965**			
Gregopimpla inquisitor (Scopoli, 1763)	*Malacosoma neustria*	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
Gregopimpla malacosomae (Seyrig, 1827)	*Malacosoma neustria*	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
***Liotryphon* Ashmead, 1900**			
Liotryphon crassiseta (Thomson, 1877)	*Bembecia scopigera*	Lepidoptera: Sessidae	Çoruh and Özbek, 2008a
***Paraperithous* Haupt, 1954**			
Paraperithous gnathaulax (Thomson, 1877)	*Saperda populnea*	Coleoptera: Cerambycidae	Özbek *et al*., 2009
***Scambus* Hartig, 1838**			
Scambus brevicornis (Gravenhorst, 1829)	*Acleris rhombana*	Lepidoptera: Tortricidae	Çoruh and Özbek, 2008a
	Archips rosana	Lepidoptera: Tortricidae	Özdemir and Özdemir, 2002
	Cnaemidophorus rhodadactyla	Lepidoptera: Pterophoridae	Özbek, 2008
	Anthonomus pomorum	Coleoptera: Curculionidae	Özdemir and Kılınçer, 1990
Scambus calobatus Gravenhorst, 1829	*Archips rosana*	Lepidoptera: Tortricidae	Özdemir and Özdemir, 2002; Çoruh and Özbek, 2008a
	Archips sp.	Lepidoptera: Tortricidae	Özder, 1999
	Tortrix viridana	Lepidoptera: Tortricidae	Özdemir and Kılınçer, 1990
	Rhagoletis cerasi	Diptera: Tephritidae	Özder, 1999
	Myzus cerasi	Homoptera: Aphididae	Özder, 1999
	Malacosoma neustria	Lepidoptera: Lasiocampidae	Özder, 1999
Scambus elegans Woldstedit, 1877	*Cydia molesta*	Lepidoptera: Tortricidae	Soydanbay, 1978
	Prays olea	Lepidoptera: Yponomeutidae	Soydanbay, 1978
	Archips rosana	Lepidoptera: Tortricidae	Doğanlar, 2003
Scambus nigricans (Thomson, 1877)	*Acleris rhombana*	Lepidoptera: Tortricidae	Çoruh and Özbek, 2008a
	Malacosoma neustria	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
Scambus planatus Hartig, 1838	*Tortrix* sp.	Lepidoptera: Tortricidae	Çoruh and Özbek, 2008a
Scambus pomorum Ratzeburg, 1848	*Tortrix* sp.	Lepidoptera: Tortricidae	Çoruh and Özbek, 2008a
Scambus sagax Hartig, 1838	*Agapanthia osmanlis*	Coleoptera: Cerambycidae	Çoruh and Tozlu, 2008

Table 3. Continued.

Names of Taxa	Hosts Name (HN)	Order and Family of Hosts (OFH)	References
TRIBE: EPHIALTINI HELLEN 1915			
***Tromatobia* Foerster, 1868**			
Tromatobia ornata (Gravenhorst, 1829)	*Malacosoma neustria*	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
TRIBE: PIMPLINI WESMAEL,1845			
***Apechtis* Föerster, 1868**			
Apechtis compunctor Linnaeus,1758	*Aporia crataegi*	Lepidoptera: Pieridae	Fahringer, 1922
***Delomerista* Foerster, 1969**			
Delomerista pfankuchi Brauns, 1905	*Diplodema marginepunctella*	Lepidoptera: Psychidae	Kolarov, 1995
***Dolichomitus* Smith, 1877**			
Dolichomitus populneus (Ratzeburg, 1848)	*Saperda populnea*	Coleoptera: Cerambycidae	Çoruh and Özbek, 2008a; Özbek *et al*., 2009
Dolichomitus sericeus (Hartig, 1847)	*Paranthrene tabaniformis*	Lepidoptera: Sesiidae	Özdemir and Kılınçer, 1990
Dolichomitus subglabratus (Perkins, 1943)	*Cydia molesta*	Lepidoptera: Tortricidae	Soydanbay, 1978
Dolichomitus tuberculatus Geoffroy, 1785	*Saperda populnea*	Coleoptera: Cerambycidae	Çoruh and Özbek, 2008a; Özbek *et al*., 2009
***Itoplectis* Foerster, 1868**			
Itoplectis alternans (Gravenhorst, 1829)	*Archips rosana*	Lepidoptera: Tortricidae	Çoruh and Özbek, 2008a
	Gypsonoma dealbana	Lepidoptera: Tortricidae	Işık *et al*., 1987
	Tortrix viridana	Lepidoptera: Tortricidae	Özdemir and Kılınçer, 1990
	Autographa gamma	Lepidoptera: Noctuidae	Okyar and Yurtcan, 2007
Itoplectis clavicornis Thomson, 1989	*Cosmia diffinis*	Lepidoptera: Noctuidae	Okyar *et al*., 2012
Itoplectis maculator (Fabricius, 1775)	*Archips* sp.	Lepidoptera: Tortricidae	Kansu *et al*., 1986; İren, 1952, 1960, 1977; Ulu, 1983; Doğanlar, 1982, 1987; Özdemir and Kılınçer, 1990
	Archips rosana	Lepidoptera: Tortricidae	Ulu, 1983; Doğanlar, 1987, 2003; Öncüer, 1991; Özdemir and Özdemir, 2002; Çoruh and Özbek, 2008a
	Acleris rhombana	Lepidoptera: Tortricidae	Çoruh and Özbek, 2008a
	Yponomeuta sp.	Lepidoptera: Yponomeutidae	Kansu *et al*., 1986; İren, 1977; Ulu, 1983; Doğanlar, 1987
	Hyponomeuta evonymella	Lepidoptera: Yponomeutidae	Çoruh and Özbek, 2008a
	Rhagoletis cerasi	Diptera: Tephritidae	Özder, 1999
	Myzus cerasi	Homoptera: Aphididae	Özder, 1999
	Malacosoma neustria		Özder, 1999
	Yponomeuta malinellus	Lepidoptera: Yponomeutidae	İren, 1952, 1960; Soydanbay, 1978; Ulu, 1983; Özdemir and Kılınçer, 1990; Öncüer, 1991; Erol and Yaşar, 1996
	Yponomeuta padellus	Lepidoptera: Yponomeutidae	İren, 1952, 1960; Soydanbay, 1978; Ulu, 1983; Özdemir and Kılınçer, 1990; Öncüer, 1991
	Yponomeuta rorellus	Lepidoptera: Yponomeutidae	İren, 1952, 1960; Soydanbay, 1978; Ulu, 1983; Özdemir and Kılınçer, 1990; Öncüer, 1991
	Tortrix viridana	Lepidoptera: Tortricidae	Özdemir and Kılınçer, 1990; Öncüer, 1991
	Hypera variabilis	Coleoptera: Curculionidae	İren, 1952, 1960; Öncüer, 1991; Özdemir and Kılınçer, 1990
	Lamprosticta culta	Lepidoptera: Noctuidae	Okyar and Yurtcan, 2007
	Autographa gamma	Lepidoptera: Noctuidae	Okyar and Yurtcan, 2007

Table 3. Continued.

Names of Taxa	Hosts Name (HN)	Order and Family of Hosts (OFH)	References
TRIBE: PIMPLINI WESMAEL,1845			
Itoplectis melanocephala (Gravenhorst, 1829)	*Galleria mellonella*	Lepidoptera: Pyralidae	Taşkın and Aksoylar, 2011
Itoplectis tunetana (Schmiedeknecht, 1914)	*Hyponomeuta evonymella*	Lepidoptera: Yponomeutidae	Çoruh and Özbek, 2008
	Yponomeuta malinellus	Lepidoptera: Yponomeutidae	Özdemir and Kılınçer, 1990; Erol and Yaşar, 1996; Gencer, 2003
	Yponomeuta padellus	Lepidoptera: Yponomeutidae	Özdemir and Kılınçer, 1990
	Yponomeuta rorellus	Lepidoptera: Yponomeutidae	Özdemir and Kılınçer, 1990
Itoplectis viduata Gravenhorst, 1829	*Malacosoma neustria*	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
	Archips rosana	Lepidoptera: Tortricidae	Özdemir and Özdemir, 2002
***Pimpla* Fabricius, 1804**			
Pimpla contemplator (Müller, 1776)	*Vanessa urticae*	Lepidoptera: Nymphalidae	Çoruh and Özbek, 2008a
Pimpla hypochondriaca Retzius, 1783	*Malacosoma neustria*	Lepidoptera: Lasiocampidae	Soydanbay, 1978; Özder, 1999
	Lymantria dispar	Lepidoptera: Lymantridae	Soydanbay, 1978
	Cydia molesta	Lepidoptera: Tortricidae	Soydanbay, 1978; Özdemir and Kılınçer, 1990
	Mamestra brassicae	Lepidoptera: Pieridae	Öncüer, 1991
	Aporia crataegi	Lepidoptera: Pieridae	Özdemir and Kılınçer, 1990; Öncüer, 1991
	Rhagoletis cerasi	Diptera: Tephritidae	Özder, 1999
	Myzus cerasi	Homoptera: Aphididae	Özder, 1999
	Archips sp.	Lepidoptera: Tortricidae	Özder, 1999
Pimpla illecebrator (Villers, 1789)	*Malacosoma franconica*	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
	Hyponomeuta evonymella	Lepidoptera: Yponomeutidae	Çoruh and Özbek, 2008a
	Malacosoma neustria	Lepidoptera: Lasiocampidae	Özdemir and Kılınçer, 1990; Öncüer, 1991
	Aporia crataegi	Lepidoptera: Pieridae	Özdemir and Kılınçer, 1990; Öncüer, 1991
Pimpla instigator Fabricius, 1793	*Pieris brassica*	Lepidoptera: Pieridae	Uzun, 1987; Özdemir and Kılınçer, 1990
	Aporia crataegi	Lepidoptera: Pieridae	Kansu, 1955; Özdemir and Kılınçer, 1990
	Cydia molesta	Lepidoptera:Tortricidae	Altay, 1966
Pimpla processioneae Ratzeburg, 1849	*Aporia crataegi*	Lepidoptera: Pieridae	Özdemir and Kılınçer, 1990
Pimpla rufipes Brullé, 1846	*Malacosoma neustria*	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
	Malacosoma franconica	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
	Acronicta rumicis	Lepidoptera: Noctuidae	Okyar and Yurtcan, 2007
	Lacanobia oleracea	Lepidoptera: Noctuidae	Okyar and Yurtcan, 2007
Pimpla spuria Gravenhorst, 1829	*Malacosoma franconica*	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a
	Hyponomeuta evonymella	Lepidoptera: Yponomeutidae	Çoruh and Özbek, 2008a
	Ostrinia nubilallis	Lepidoptera: Pyralidae	Özdemir, 1981
	Lobesia botrana	Lepidoptera: Tortricidae	Özdemir and Kılınçer, 1990; Öncüer, 1991
Pimpla turionellae Linnaeus, 1758	*Malacosoma neustria*	Lepidoptera: Lasiocampidae	İren, 1952; Çoruh and Özbek, 2008a; Kansu *et al*., 1986
	Archips sp.	Lepidoptera: Tortricidae	Kansu *et al*., 1986
	Archips rosana	Lepidoptera: Tortricidae	Özdemir and Özdemir, 2002
	Malacosoma franconica	Lepidoptera: Lasiocampidae	Çoruh and Özbek, 2008a

Table 3. Continued.

Names of Taxa	Hosts Name (HN)	Order and Family of Hosts (OFH)	References
TRIBE: PIMPLINI WESMAEL,1845			
***Pimpla* Fabricius, 1804**			
Pimpla turionellae Linnaeus, 1758	*Yponomeuta* sp.	Lepidoptera: Yponomeutidae	İren, 1960; Kansu *et al*., 1986
	Yponomeuta malinellus	Lepidoptera: Yponomeutidae	İren, 1960, 1977; Soydanbay, 1978; Özdemir and Kılınçer, 1990; Erol and Yaşar, 1996; Öncüer, 1991
	Yponomeuta padellus	Lepidoptera: Yponomeutidae	İren, 1960, 1977; Soydanbay, 1978; Özdemir and Kılınçer, 1990; Öncüer, 1991
	Yponomeuta rorellus	Lepidoptera: Yponomeutidae	İren, 1960, 1977; Soydanbay, 1978; Özdemir and Kılınçer, 1990; Öncüer, 1991
	Cydia sp.	Lepidoptera: Tortricidae	İren, 1952; Kansu *et al*., 1986
	Cydia pomonella	Lepidoptera: Tortricidae	İren, 1960, 1977
***Theronia* Holmgren, 1859**			
Theronia atalantae atalantae (Poda, 1761)	*Malacosoma neustria* L.	Lepidoptera: Lasiocampidae	Schimitschek, 1944
	Aporia sp.	Lepidoptera: Pieridae	Öncüer, 1991

Table 4. Plants visited by pimpline adults in Turkey.

Insect Species	Plant Species	Family of Plant Species	Reference (s)
Pimpla hypochondriaca	*Carum carvi* L.	Family: Apiaceae	Çoruh and Çoruh, 2008
	Daucus carota L.		
	Ferula communis L.		
	Seseli libanotis (L.) W. Koch		
Pimpla illecebrator	*Abies cilicia* (Ant. and Kotschy) Carr.	Family: Pinaceae	Sedivy, 1959
Pimpla spuria	*Scolimus hispanicus* L.	Family: Asteraceae	Özdemir, 1981
Pimpla turionellae	*Heracleum platytenium* L. *Heracleum spondylum* L.	Family: Apiaceae	Fahringer, 1922

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