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REVIEW ARTICLE

Overview of the distribution and biogeography of Crabronidae in Turkey (Hymenoptera: Aculeata)

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Abstract: Faunistic and systematic studies on Crabronidae of Turkey are reviewed and the distribution and biogeography of the Turkish Crabronid wasp fauna is analyzed. In this study, 21 species and subspecies of 2 genera of Astatinae, 122 species and subspecies of 19 genera of Bembicinae, 72 species and subspecies of 3 genera of Philanthinae, 61 species and subspecies of 13 genera of Pempherdoninae, 2 species of 1 genus of Mellininae, 1 species of 1 genus of Dinetinae and 238 species and subspecies of 26 genera of Crabroninae are recorded. In total, 502 species and 15 subspecies belonging to 65 genera of Crabronidae are recorded from Turkey. Among them, 44 species and 6 subspecies comprising 9,7% of Turkish crabronids are endemic. Furthermore, the type localities of 69 species and 10 subspecies of Crabronidae are located in Turkey. Species composition, diversity and proportion of endemism varies considerably between the biogeographic subregions of the country.

Key words: Hymenoptera, Crabronidae, distribution, biogeography, Turkey.

Introduction

Biogeography is the branch of biology that studies the geographical distribution of animals and plants. Biogeographic regions are usually defined separately for floral and faunal communities and are largely restricted to the terrestrial areas of the Earth. Turkey is generally divided into seven geographical regions. These geographical regions were separated according to their climate, location, flora and fauna, human habitat, agricultural diversities,

transportation, topography and so on. Four regions were named after the seas bordering them; the Aegean Region, the Black Sea Region, the Marmara Region and the Mediterranean Region. The other three regions were named in accordance with their location in the whole of Anatolia; Central, Eastern and Southeastern Anatolia Regions (Figure 1). Turkey is a mountainous mass averaging about 1.000 meters in height. The topographic and climatic structure give the country the opportunity to host a rich and diverse fauna. Turkey is one of the most interesting countries from the point of view of Hymenoptera taxonomy and biogeography. The Hymenoptera are one of the four largest orders of insects, with over 152.677 described recent species around the world (Aguiar *et al.* 2013).

Turkey occupies Asia Minor between the Mediterranean Sea and the Black Sea and stretches into continental Europe. It has been known to possess a rich Crabronidae fauna (Ljubomirov & Yıldırım 2008). Crabronidae fauna in Turkey is very rich also in comparison to others countries of the Mediterranean region. Thus, many faunistic and systematic studies about the family Crabronidae have been conducted by both foreign and native researchers in Turkey. However, no attempt has been undertaken to evaluate the distribution and biogeography of Crabronidae in Turkey. Yet, such a study is essential for researchers who are interested in Crabronidae in West Palaearctic region including Turkey.

In this paper, the publications on the Crabronidae in Turkey were reviewed (Antropov 1989, 1991, 1995; Atanassov 1955, 1964; Bayındır *et al.* 2013; Berland 1926, 1928; Bouček 2001; Budrys 1998, 2000; Bytinski-Salz 1957; Coulon 1925; Çubuk, *et al.* 2013; de Andrade 1960; de Beaumont 1937, 1947, 1953a,b, 1954, 1957, 1958, 1961, 1968, 1969; de Beaumont *et al.* 1956; Dollfuss 1986, 1991, 1995, 2001, 2004a,b, 2006, 2008; Fahringer 1922; Fahringer & Friese 1921; Gayubo & Özbek 2005; Gayubo *et al.* 1992, 2003; Guichard 1991; Gülmez & Tüzün 2005; Handlirsch 1887, 1888, 1889, 1892, 1893, 1895; Hensen 1989; Hensen & Ooijen 1987; Hepdurgun *et al.* 2007; Jacobs 2006; Japoshvili & Ljubomirov 2012; Kemal & Koçak 2013; Koçak & Yalçın 2012; Kohl 1884a,b, 1885, 1905, 1915; Leclercq 1954, 1975, 1989, 1993, 1999; Ljubomirov & Yıldırım 2008; Maidl 1914; Mocsáry 1883; Nemkov 2001, 2003, 2005; Ohl 1999; Pulawski 1955, 1959, 1962, 1967, 1971, 1973, 1974, 1977, 1979a,b, 1984, 1995, 2007; Pulawski & Prentice 2008; Radoszkowski 1887; Roth 1959; Schletterer 1887; Schmid-Egger 2000, 2002a,b, 2004, 2005; Schmid-Egger & Bitsch 2007a,b,c; Schmidt 1997; Schmidt & Bitsch 2007; Schulz 1904; Straka 2005; Tezcan *et al.* 2006; Tüzün *et al.* 1999; Tüzün & Yüksel 2010; Uygun 1994; Valkeila & Leclercq 1972; Yıldırım 2011; Yıldırım & Ljubomirov 2005, 2007) and the biogeography of the Turkish fauna of Crabronidae have been analyzed.

In this paper, the previous publications on the Crabronidae of Turkey are reviewed and the distribution and biogeography of the Turkish fauna of Crabronidae has been analyzed. In the following text, the species and subspecies whose type localities are in Turkey are marked with an asterisk (*), and the endemic species and subspecies are indicated as such. Faunal similarities between biogeographical regions of Turkey were evaluated, without regard to differences in region area by using Sorensen's coefficient of similarity (see Legendre & Legendre 1998). The similarity matrix resulting from pair-wise calculations was then subjected to unweighted arithmetic average clustering (UPGMA; PAST program, version 1.57, Hammer *et al.* 2006).

Discussion

As a result, 21 species and subspecies of 2 genera of Astatinae, 122 species and subspecies of 19 genera of Bembicinae, 72 species and subspecies of 3 genera of Philanthinae, 61 species and subspecies of 13 genera of Pempherdoninae, 2 species of 1

genus of Mellininae, 1 species of 1 genus of Dinetinae and 238 species and subspecies of 26 genera of Crabroninae are recorded. In total, 502 species and 15 subspecies belonging to 65 genera of Crabronidae are recorded. Among them, 44 species and 6 subspecies or 9,7% of Turkish crabronids are endemic. (Tables 1, 2, 3). Furthermore, the type localities of 69 species and 10 subspecies of Crabronidae are situated in Turkey.

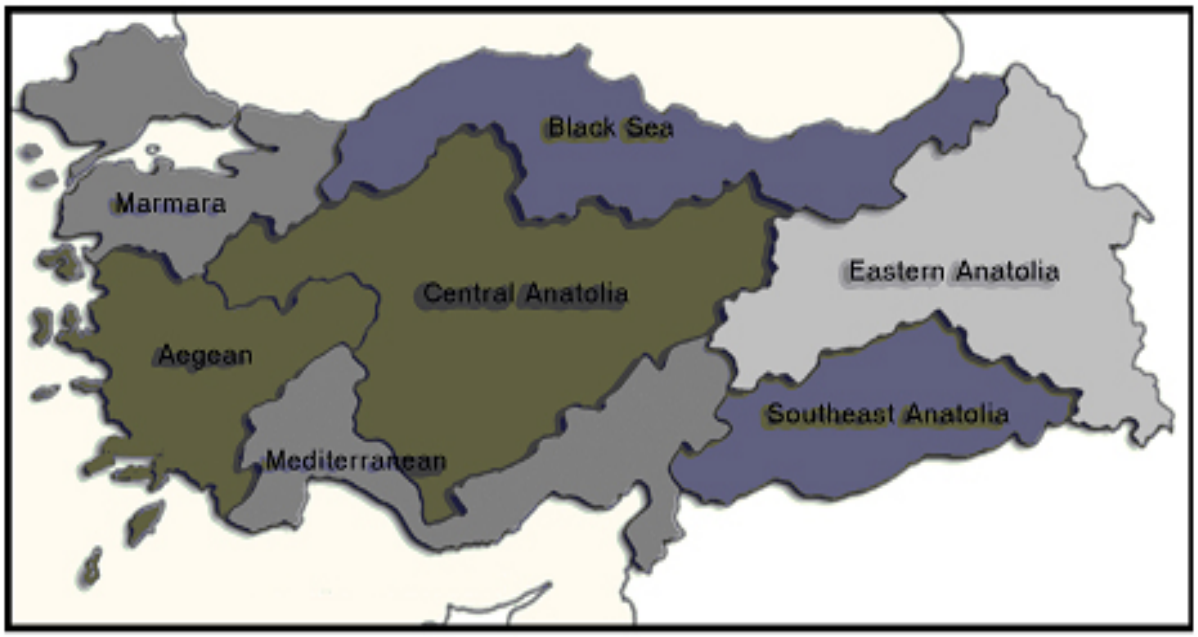

Figure 1. Biogeographical map of Turkey (1/3.200.000) (from: Yıldırım & Lelej 2012).

Table 1. The number of species of the Turkish Crabronidae by genus.

Family	Subfamily	Genus	Number of species and subspecies	Number of endemic species and subspecies
Crabronidae	**Astatinae**	***Astata***	16	2
		Dryudella	5	1
	Bembicinae	***Alysson***	4	1
		Didineis	4	1
		Nippononysson	1	1
		Brachystegus	2	-
		Nysson	17	2
		Olgia	2	-
		Argogorytes	2	-
		Gorytes	15	2
		Harpactus	13	4
		Hoplisoides	3	-
		Lestiphorus	1	-
		Oryttus	2	1
		Psammaecius	1	-
		Ammatomus	3	-
		Sphecius	3	-
		Bembecinus	20	10
		Stizoides	3	-

		Stizus	10	-
		Bembix	16	1
	Philanthinae	***Philanthus***	11	-
		Philanthinus	1	-
		Cerceris	60	6
	Pempherdoninae	***Entomosericus***	2	-
		Lithium	2	1
		Mimesa	8	-
		Mimumesa	3	-
		Psen	1	-
		Psenulus	8	-
		Ammoplanus	8	1
		Ammaplanellus	1	-
		Diodontus	6	-
		Passaloecus	10	-
		Pemphredon	8	-
		Spilomena	3	-
		Stigmus	1	-
	Mellininae	***Mellinus***	2	-
	Dinetinae	***Dinetus***	1	-
	Crabroninae	***Palarus***	4	
		Larra	1	-
		Liris	5	-
		Ancistromma	1	-
		Gastrosericus	2	-
		Holotachysphex	1	-
		Parapiagetia	1	-
		Prosopigastra	5	-
		Tachysphex	61	5
		Tachytes	10	-
		Miscophus	14	3
		Nitela	4	-
		Solierella	3	-
		Pison	2	-
		Trypoxylon	15	1
		Belomicrus	6	2
		Oxybelus	19	-
		Entomognathus	4	1
		Crabro	4	-
		Crossocerus	23	1
		Ectemnius	21	-
		Lestica	6	-
		Lindenius	20	2
		Odontocrabro	1	1
		Rhopalum	4	-
		Tracheliodes	1	-
	Total	**65**	**517**	**50**

Table 2. Distribution of Crabronidae in Biogeographic Regions in Turkey (the classification of Crabronidae follows Pulawski 2013).

Names of taxa	**EA**	**SA**	**BS**	**CA**	**MD**	**A**	**M**
Subfamily Astatinae Lepeletier de Saint Fargeau, 1845							
Tribe Astatini Lepeletier de Saint Fargeau, 1845							

Genus ***Astata*** Latreille, 1796							
****Astata affinis radoszkowskii*** Puławski, 1957	+	-	-	+	+	-	-
Astata apostata Mercet, 1910	+	-	-	+	+	-	-
Astata boops (Schrank, 1781)	+	-	+	+	+	+	+
Astata brevitarsis Puławski, 1958	+	-	-	-	-	+	-
Astata costae A. Costa, 1867	+	-	+	-	+	+	-
****Astata diversipes*** Puławski, 1955	+	-	-	-	+	-	-
Astata gallica de Beaumont, 1942	+	-	-	-	-	-	-
Astata graeca de Beaumont, 1965	+	-	+	+	-	-	-
Astata jucunda Puławski, 1959	+	-	+	+	-	-	+
Astata kashmirensis Nurse, 1909	+	-	+	+	+	+	+
****Astata leila*** Puławski, 1967	-	-	-	+	-	-	-
Astata miegii scapularis Kohl, 1889	+	-	+	+	-	+	+
Astata minor Kohl, 1885	+	-	+	+	+	-	+
Astata pontica (Puławski, 1958)	-	-	-	+	+	-	-
Astata quettae Nurse, 1903	+	-	-	-	-	-	-
Astata rufipes Mocsáry, 1883	+	-	-	-	-	-	-
Genus ***Dryudella*** Spinola, 1843							
Dryudella amenartais Puławski, 1967	+	-	-	-	-	-	-
Dryudella freygessneri (Carl, 1920)	+	-	-	-	-	+	-
Dryudella picticornis Gussakovskji, 1927	+	-	-	-	-	-	-
****Dryudella tricolor anatolica*** (Puławski , 1967)	+	-	+	+	-	-	-
Dryudella tricolor eurygnatha (Puławski, 1967)	+	-	+	+	+	+	-
Subfamily Bembicinae Latreille, 1802							
Tribe Alyssontini de Dalla Torre, 1897							
Genus ***Alysson*** Panzer, 1806							
****Alysson ocellatus*** de Beaumont, 1967	-	-	+	-	-	-	-
Alysson ratzeburgi Dahlbom, 1843	-	-	+	-	-	-	-
Alysson spinosus (Panzer, 1801)	-	-	+	-	+	+	+
Alysson tricolor Lepeletier de Saint Fargeau & Audinet-Serville, 1825	-	-		+	-	-	-
Genus ***Didineis*** Wesmael, 1852							
Didineis crassicornis (Handlirsch, 1888)	+	-	-	-	-	-	-
****Didineis latro*** (de Beaumont, 1967)	-	-	-	-	+	-	-
Didineis pannonica Handlirsch, 1888	+	-	-	+	-	-	-
Didineis wuestneii Handlirsch, 1888	-	-	+	-	-	-	-
Tribe Nyssonini Latreille, 1804							
Subtribe Nurseina Nemkov & Lelej, 2013							
Genus ***Nippononysson*** Yasumatsu & Maidl, 1936							
****Nippononysson inexpectatus*** de Beaumont, 1967	-	-	+	-	-	-	-
Subtribe Nyssonina Latreille, 1804							
Genus ***Brachystegus*** A. Costa, 1859							
Brachystegus incertus (Radoszkowski, 1877)	-	-	+	-	+	-	-
Brachystegus scalaris (Illiger, 1807)	+	-	+	+	-	-	-
Genus ***Nysson*** Latreille, 1797							
Nysson decemmaculatus (Spinola, 1808)	+	+	+	+	+	+	-
Nysson dimidiatus Jurine, 1807	-	-	-	-	+	-	-
Nysson epeoliformis (F. Smith, 1856)	+	-	-	+	+	-	-
Nysson fulvipes A. Costa, 1859	+	+	+	+	-	-	-
****Nysson harveyi*** (de Beaumont, 1967)	-	-	-	+	-	-	-
Nysson gerstaeckeri Handlirsch, 1887	+	+	-	+	-	-	-
****Nysson guichardi*** de Beaumont, 1967	-	-	-	+	-	-	-
****Nysson inornatus*** de Beaumont, 1967	-	-	-	-	+	-	-
Nysson interruptus (Fabricius, 1798)	+	-	+	+	-	+	+
Nysson maculosus (Gmelin, 1790)	+	-	+	+	-	-	-
Nysson militaris (Gerstaecker, 1867)	+	-	+	+	+	-	-
Nysson pratensis Mercet, 1909	+	-	-	-	-	-	-
Nysson spinosus (J. Forster, 1771)	+	-	+	-	-	-	+

Nysson trichopygus de Beaumont, 1967	-	-	-	-	+	-	-
Nysson tridens Gerstaecker, 1867	+	-	-	-	-	-	-
Nysson trimaculatus (Rossi, 1790)	-	-	-	-	-	-	+
Nysson variabilis Chevrier, 1867	+	-	-	-	-	-	-
Tribe Bembicini Latreille, 1802							
Subtribe Exeirina de Dalla Torre, 1897							
Genus ***Olgia*** Radoszkowski, 1877							
Olgia helena de Beaumont, 1953	+	+	-	+	+	+	+
Olgia spinulosa de Beaumont, 1953	+	-	-	+	+	-	-
Subtribe Gorytina Lepeletier de Saint Fargeau, 1845							
Genus ***Argogorytes*** Ashmead, 1899							
Argogorytes fargeii (Shuckard, 1837)	+	-	+	+	+	+	+
Argogorytes mystaceus (Linnaeus, 1761)	+	-	+	+	-	-	+
Genus ***Gorytes*** Latreille, 1804							
Gorytes albidulus (Lepeletier de Saint Fargeau, 1832)	+	-	+	+	-	-	-
Gorytes foveolatus Handlirsch, 1888	+	+	-	+	+	+	+
Gorytes hebraeus de Beaumont, 1953	+	-	+	+	+	-	-
Gorytes kohlii Handlirsch, 1888	-	-	-	-	+	-	-
Gorytes laticinctus (Lepeletier de Saint Fargeau, 1832)	+	-	+	-	-	-	-
Gorytes nigrifacies (Mocsáry, 1879)	+	-	+	+	+	+	-
Gorytes pleuripunctatus (A. Costa, 1859)	+	+	+	+	+	+	+
Gorytes procrustes Handlirsch, 1888	+	-	-	-	-	-	+
Gorytes quadrifasciatus (Fabricius, 1804)	+	-	-	-	-	-	+
Gorytes quinquecinctus (Fabricius, 1793)	+	+	+	+	+	+	+
Gorytes quinquefasciatus (Panzer, 1798)	+	+	+	+	+	+	+
Gorytes schlettereri ponticus de Beaumont, 1967	+	-	+	-	-	-	-
Gorytes schmidti Schmid-Egger, 2002	-	+	-	-	-	-	-
Gorytes schmiedeknechtii Handlirsch, 1888	+	+	+	+	+	+	+
Gorytes sulcifrons (A. Costa, 1869)	+	-	+	+	-	-	-
Genus ***Harpactus*** Shuckard, 1837							
Harpactus adventicus (de Beaumont, 1967)	-	-	-	+	-	-	-
Harpactus affinis (Spinola, 1808)	+	-	+	+	+	-	+
Harpactus coccineus (Balthasar, 1954)	-	-	-	-	+	-	-
Harpactus dimorphus (Puławski, 1979)	-	+	-	-	-	-	-
Harpactus elegans (Lepeletier de Saint Fargeau, 1832)	+	-	+	+	+	-	-
Harpactus formosus Jurine, 1807	+	+	+	-	+	-	-
Harpactus immaculatus (Puławski, 1979)	-	-	-	-	+	-	-
Harpactus laevis (Latreille, 1792)	+	-	-	-	+	-	-
Harpactus morawitzi Radoszkowsky, 1884	-	-	+	+	+	-	+
Harpactus obscurus (de Beaumont, 1969)	-	-	-	+	-	-	-
Harpactus osdroene (de Beaumont, 1969)	-	+	-	-	-	-	-
Harpactus tauricus Radoszkowski, 1884	-	-	+	-	-	-	-
Harpactus transiens A. Costa, 1887	+	-	-	+	+	-	-
Genus ***Hoplisoides*** Gribodo, 1884							
Hoplisoides craverii (A. Costa, 1867)	+	-	+	+	+	-	-
Hoplisoides latifrons (Spinola, 1808)	+	-	-	+	-	-	-
Hoplisoides punctuosus (Eversmann, 1849)	+	+	+	-	+	+	-
Genus ***Lestiphorus*** Lepeletier de Saint Fargeau, 1832							
Lestiphorus bicinctus (Rossi, 1794)	+	-	-	-	-	-	-
Genus ***Oryttus*** Spinola, 1836							
Oryttus concinnus paradisiacus (de Beaumont, 1967)	+	-	-	-	-	+	-
Oryttus infernalis (Handlirsch, 1888)	-	-	-	-	+	+	+
Genus ***Psammaecius*** Lepeletier de Saint Fargeau, 1832							
Psammaecius punctulatus (Vander Linden, 1829)	+	-	-	+	+	+	+
Subtribe Spheciina Nemkov & Ohl, 2011							
Genus ***Ammatomus*** A. Costa, 1859							
Ammatomus coarctatus (Spinola, 1808)	+	+	+	+	+	+	+
Ammatomus rogenhoferi (Handlirsch, 1888)	+	+	+	+	+	+	+

Ammatomus rufonodis (Radoszkowski, 1877)	-	+	-	-	+	-	-
Genus ***Sphecius*** Dahlbom, 1843							
Sphecius antennatus (Klug, 1845)	+	-	+	+	+	-	+
Sphecius conicus (Germar, 1817)	+	-	-	-	+	-	-
Sphecius nigricornis (Dufour, 1838)	+	-	+	+	+	-	-
Subtribe Stizina A. Costa, 1859							
Genus ***Bembecinus*** A. Costa, 1859							
Bembecinus acanthomerus (Morice, 1911)	+	+	-	+	+	-	-
****Bembecinus anatolicus*** de Beaumont, 1968	-	+	+	+	+	-	-
Bembecinus asiaticus iranicus Schmid-Egger, 2004	+	+	-	-	+	-	-
****Bembecinus birecikensis*** Schmid-Egger, 2004	-	+	-	-	-	-	-
Bembecinus cyprius de Beaumont, 1954	-	+	+	-	+	+	-
****Bembecinus guichardi*** Schmid-Egger, 2004	+	+	-	-	-	-	-
****Bembecinus gusenleitneri*** de Beaumont, 1967	-	-	+	+	+	+	-
Bembecinus gynandromorphus (Handlirsch, 1892)	-	+	-	+	-	+	-
****Bembecinus heinrichi*** Schmid-Egger, 2004	-	+	-	-	+	-	-
****Bembecinus henseni*** Schmid-Egger, 2004	-	+	-	-	-	-	-
Bembecinus hungaricus (Frivaldszky, 1877)	-	-	+	-	+	+	+
****Bembecinus innocens*** de Beaumont, 1967	+	+	-	+	+	-	-
Bembecinus meridionalis A. Costa, 1859	-	+	-	+	+	+	-
****Bembecinus nigrolabrum*** Schmid-Egger, 2004	+	-	-	+	-	-	-
Bembecinus peregrinus (F. Smith, 1856)	+	+	+	+	+	+	+
Bembecinus rhodius de Beaumont, 1960	+	-	+	-	+	+	-
****Bembecinus schwarzi*** de Beaumont, 1967	-	-	-	-	+	+	-
Bembecinus tridens (Fabricius, 1781)	+	+	+	+	+	+	+
****Bembecinus urfanensis*** Schmid-Egger, 2004	-	+	-	-	-	-	-
Bembecinus validior Gussakovskij, 1952	+	+	-	-	+	-	-
Genus ***Stizoides*** Guérin-Méneville, 1844							
Stizoides crassicornis (Fabricius, 1787)	+	-	-	-	-	-	+
Stizoides melanopterus (Dahlbom, 1845)	+	-	-	+	+	+	+
Stizoides tridentatus (Fabricius, 1775)	+	-	+	+	+	-	+
Genus ***Stizus*** Latreille, 1802							
Stizus annulatus (Klug, 1845)	+	-	-	+	-	-	+
Stizus bipunctatus (F. Smith, 1856)	-	-	-	-	+	+	+
****Stizus combustus*** (F. Smith, 1856)	-	-	+	-	-	-	-
Stizus fasciatus (Fabricius, 1781)	-	+	-	+	+	+	+
Stizus handlirschi Radoszkowski, 1893	-	-	-	-	+	-	-
Stizus kohlii Mocsáry, 1883	-	-	-	-	+	-	-
Stizus perrisi Dufour, 1838	+	-	-	-	-	-	-
Stizus pubescens (Klug, 1835)	-	+	-	+	+	+	-
Stizus ruficornis (J. Forster, 1771)	+	-	+	+	+	+	+
Stizus tricolor Handlirsch, 1892	-	-	-	-	+	-	-
Subtribe Bembicina Latreille, 1802							
Genus ***Bembix*** Fabricius, 1775							
Bembix arenaria Handlirsch, 1893	-	-	-	-	+	-	-
Bembix bicolor Radoszkowski, 1877	+	-	+	+	+	-	-
Bembix bidentata Vander Linden, 1829	+	-	+	+	+	+	+
****Bembix ciliciensis*** de Beaumont, 1967	-	-	-	-	+	-	-
Bembix cinctella Handlirsch, 1893	+	-	+	+	+	+	+
Bembix diversipes F. Morawitz, 1889	+	-	+	+	-	+	-
Bembix eburnea Radoszkowski, 1877	-	-	-	+	-	-	-
Bembix gracilis Handlirsch, 1893	+	-	-	-	+	-	-
Bembix megerlei Dahlbom, 1845	-	-	-	-	-	-	+
Bembix oculata Panzer, 1801	+	+	-	+	+	+	+
Bembix olivacea Fabricius, 1787	+	+	+	+	+	+	-
Bembix pallida Radoszkowski, 1877	+	-	+	+	+	+	+
Bembix portchinskii Radoszkowsky, 1884	+	-	-	-	-	-	-
Bembix rostrata (Linnaeus, 1758)	+	-	+	+	-	+	+

Bembix sinuata Panzer, 1804	+	-	-	+	-	+	-
Bembix turca Dahlbom, 1845	-	-	-	-	+	-	-
Subfamily Philanthinae Latreille, 1802							
Tribe Philanthini Latreille, 1802							
Subtribe Philanthina Latreille, 1802							
Genus ***Philanthus*** Fabricius, 1790							
Philanthus coarctatus Spinola, 1839	-	-	-	-	+	-	-
Philanthus coronatus coronatus (Thunberg, 1784)	+	-	+	+	-	+	-
Philanthus coronatus orientalis Bytinski-Salz, 1959	-	+	-	-	-	-	-
Philanthus decemmaculatus Eversmann, 1849	-	-	-	-	-	+	-
Philanthus dufouri Lucas, 1849	+	-	-	+	-	-	-
Philanthus kohlii F. Morawitz, 1890	+	-	-	-	-	-	-
Philanthus kokandicus Radoszkowski, 1877	+	-	-	-	-	-	-
Philanthus reinigi Bischoff, 1930	+	-	-	-	-	-	-
Philanthus triangulum (Fabricius, 1775)	+	+	+	+	+	+	+
Philanthus variegatus Spinola, 1839	+	-	-	-	-	-	-
Philanthus venustus (Rossi, 1790)	+	-	+	+	+	+	+
Subtribe Philanthinina Menke, 1967							
Genus ***Philanthinus*** de Beaumont, 1949							
Philanthinus quattuordecimpunctatus (F. Morawitz, 1888)	+	-	+	+	-	-	-
Tribe Cercerini Lepeletier de Saint Fargeau, 1845							
Genus ***Cerceris*** Latreille, 1802							
Cerceris aerate Kazenas, 1972	+	-	-	-	-	-	-
Cerceris albicolor Shestakov, 1918	+	-	-	+	+	+	+
Cerceris albofasciata (Rossi, 1790)	+	-	-	-	-	-	-
Cerceris angustata F. Morawitz, 1893	-	-	-	+	+	-	-
Cerceris arenaria (Linnaeus, 1758)	+	-	+	+	+	+	+
Cerceris bicincta Klug, 1835	+	-	-	+	-	+	+
Cerceris bracteata Eversmann, 1849	+	-	+	-	-	-	-
Cerceris bupresticida Dufour, 1841	+	-	+	+	+	+	+
Cerceris cheskesiana Giner Marí, 1945	+	+	-	-	+	-	-
Cerceris circularis dacica Schletterer, 1887	+	-	-	+	+	+	-
Cerceris conica Shestakov, 1918	+	+	-	-	-	-	-
Cerceris cupes Shestakov, 1918	+	-	-	-	-	-	-
Cerceris deserticola F. Morawitz, 1890	+	-	-	-	-	-	-
Cerceris dispar Dahlbom, 1845	-	+	+	+	+	+	+
Cerceris dorsalis Eversmann, 1849	+	-	-	-	+	-	-
Cerceris eryngii Marquet, 1875	+	-	+	+	+	+	+
Cerceris eucharis Schletterer, 1887	+	+	-	+	+	-	-
Cerceris euryanthe euryanthe Kohl, 1888	+	+	+	+	+	-	+
Cerceris euryanthe palaestina de Beaumont, 1959	+	+	-	-	+	-	-
Cerceris eversmanni caucasica Shestakov, 1915	+	-	-	+	-	-	-
****Cerceris eversmanni warnckei*** K. Schmidt, 2000	+	+	-	-	-	-	-
Cerceris fimbriata (Rossi, 1790)	+	+	+	+	+	+	-
Cerceris flavicornis Brullé, 1833	+	+	+	+	+	+	+
Cerceris flavilabris flavilabris (Fabricius, 1793)	+	-	+	+	+	-	+
Cerceris flavilabris laminata Eversmann, 1849	-	-	+	-	-	-	-
Cerceris galathea de Beaumont, 1959	+	-	-	-	-	-	-
****Cerceris gusenleitneri*** K. Schmidt, 2000	+	-	+	-	-	-	-
****Cerceris inara*** de Beaumont, 1967	+	+	-	+	+	-	-
Cerceris interrupta (Panzer, 1799)	-	-	-	-	-	+	+
Cerceris lunata A. Costa, 1867	+	+	+	+	+	+	+
****Cerceris maculicrus*** de Beaumont, 1967	-	-	-	-	+	+	-
Cerceris media Klug, 1835	+	-	-	+	+	-	-
Cerceris odontophora Schletterer, 1887	+	-	+	+	+	+	-
Cerceris pleurispina de Beaumont, 1959	-	+	-	-	-	-	-
Cerceris quadricinctus (Panzer, 1799)	+	-	+	+	+	+	+
Cerceris quadrifasciatus (Panzer, 1799)	+	-	+	+	+	+	-

Cerceris quinquefasciatus (Rossi, 1792)	+	-	-	+	-	-	-
Cerceris rhinoceros Kohl, 1888	-	+	-	-	+	-	-
Cerceris rubida pumilio Giner Marí, 1945	-	-	-	-	+	-	-
Cerceris rubida rubida (Jurine, 1807)	+	-	+	+	+	+	+
Cerceris ruficornis (Fabricius, 1793)	+	-	+	+	-	+	+
Cerceris rutila mavromoustakisi Giner Marí, 1945	+	-	-	-	+	-	-
Cerceris rybyensis (Linnaeus, 1771)	+	-	+	+	-	+	+
Cerceris sabulosa (Panzer, 1799)	+	+	+	+	+	+	+
****Cerceris seleukos*** K. Schmidt, 2000	+	+	-	-	+	-	-
Cerceris spectabilis Radoszkowski, 1886	-	+	-	-	-	-	-
Cerceris specularis fergusoni de Beaumont, 1959	+	+	-	-	+	-	-
Cerceris specularis specularis A. Costa, 1867	+	+	-	+	-	+	-
Cerceris spinaea de Beaumont, 1970	-	+	-	-	-	-	-
****Cerceris spinifera haladai*** K. Schmidt, 2000	-	+	-	-	-	-	-
Cerceris spinipectus spinipectus F. Smith, 1856	-	-	+	+	+	+	+
Cerceris spinipectus spinolica Schletterer, 1887	-	+	-	-	-	-	-
Cerceris straminea hebraea de Beaumont, 1959	-	+	-	-	+	-	-
Cerceris stratiotes Schletterer, 1887	+		+	+	+	-	-
****Cerceris stratonike*** K. Schmidt, 2000	+	+	-	+	+	-	-
Cerceris tenuivittata Dufour, 1849	+	+	-	-	-	-	-
Cerceris tetradonta Cameron, 1890	-	+	-	-	-	-	-
Cerceris tuberculata gemmina Shestakov, 1927	+	-	-	+	-	-	-
Cerceris tuberculata tuberculata (de Villers, 1789)	+	-	-	+	+	+	+
Cerceris vagans Radoszkowski, 1877	+	+	-	-	+	-	-
Subfamily Pemphredoninae Dahlbom, 1835							
Tribe Entomosericini von Dalla Torre, 1897							
Genus ***Entomosericus*** Dahlbom, 1845							
Entomosericus concinnus (Dahlbom, 1845)	+	+	+	+	+	+	-
****Entomosericus hauseri*** Schmid-Egger, 2000	-	+	-	-	+	-	-
Tribe Psenini A. Costa, 1858							
Genus ***Lithium*** Finnamore, 1987							
****Lithium haladai*** Schmid- Egger, 2007	+	-	-	-	+	-	-
****Lithium jacobsi*** Schmid- Egger, 2007	-	+	-	-	+	-	-
Genus ***Mimesa*** Shuckard, 1837							
Mimesa crassipes A. Costa, 1871	+	-	+	+	+	+	-
Mimesa equestris (Fabricius, 1804)	+	-	+	-	-	-	-
Mimesa grandii Maidl, 1933	+	-	-	+	+	-	-
Mimesa jacobsoni transiliensis Budrys, 1985	+	-	-	-	-	-	-
Mimesa lutaria (Fabricius, 1787)	+	-	-	-	-	-	-
Mimesa nasuta Budrys, 1985	+	-	-	+	-	-	-
Mimesa nigrita Eversmann, 1849	-	+	-	-	+	-	+
Mimesa vindobonensis Maidl, 1914	+	-	-	-	-	-	-
Genus ***Mimumesa*** Malloch, 1933							
Mimumesa atratina (F. Morawitz, 1891)	+	-	+	-	-	-	-
Mimumesa dahlbomi (Wesmael, 1852)	-	-	+	-	-	-	-
Mimumesa unicolor (Vander Linden, 1829)	+	-	+	+	+	+	-
Genus ***Psen*** Latreille, 1796							
Psen ater (Olivier, 1792)	-	-	+	-	-	+	-
Genus ***Psenulus*** Kohl, 1897							
Psenulus concolor (Dahlbom, 1843)	-	-	+	+	-	-	-
Psenulus fulvicornis (Schenck, 1857)	-	+	-	-	+	+	-
Psenulus fuscipennis (Dahlbom, 1843)	-	-	+	+	-	-	+
Psenulus laevigatus (Schenck, 1857)	+	-	-	-	-	-	-
Psenulus meridionalis de Beaumont, 1937	+	+	+	-	+	-	+
Psenulus pallipes (Panzer, 1798)	+	+	+	+	+	+	+
****Psenulus pan*** de Beaumont, 1967	+	+	-	-	+	-	-
Psenulus schencki (Tournier, 1889)	+	-	+	+	+	+	-
Tribe Pemphredonini Dahlbom, 1835							

Subtribe Ammoplanina Evans, 1959							
Genus ***Ammoplanus*** Giraud, 1869							
****Ammoplanus denesi*** Bouček, 2001	-	+	-	-	-	-	-
Ammoplanus hofferi Šnoflák, 1943	+	-	-	+	-	-	-
Ammoplanus kaszabi Tsuneki, 1972	-	+	-	-	-	-	-
Ammoplanus marathroicus (De Stefani Perez, 1887)	-	-	-	-	+	-	-
****Ammoplanus minutus*** Bouček, 2001	-	-	-	+	-	+	-
Ammoplanus monticola Gussakovskij, 1952	+	-	-	-	-	-	-
Ammoplanus perrisi Giraud, 1869	-	-	-	+	-	-	-
Ammoplanus rjabovi (Gussakovskij, 1952)	-	-	-	-	+	-	-
Genus ***Ammaplanellus*** Gussakovskij, 1931							
Ammoplanellus simplex (Gussakovskij, 1952)	-	-	-	-	+	-	-
Subtribe Pemphredonina Dahlbom, 1835							
Genus ***Diodontus*** Curtis, 1834							
****Diodontus brevilabris*** de Beaumont, 1967	+	+	+	+	+	+	-
Diodontus luperus Shuckard, 1837	+	+	+	-	+	-	-
Diodontus medius Dahlbom, 1844	-	-	-	-	-	-	+
Diodontus minutus (Fabricius, 1793)	+	+	+	-	+	-	+
Diodontus temporalis Kohl, 1901	-	-	-	+	-	-	-
Diodontus tristis (Vander Linden, 1829)	-	-	+	+	-	-	+
Genus ***Passaloecus*** Shuckard, 1837							
Passaloecus australis Merisuo, 1976	+	-	-	-	-	-	-
Passaloecus corniger Shuckard, 1837	-	-	+	+	+	-	+
Passaloecus eremita Kohl, 1893	-	-	-	+	-	-	-
Passaloecus gracilis (Curtis, 1834)	+	+	-	+	-	-	-
Passaloecus insignis (Vander Linden, 1829)	-	-	+	-	-	-	-
Passaloecus pictus Ribaut, 1952	-	-	-	-	+	-	-
Passaloecus ribauti Merisuo, 1974	-	+	-	-	+	-	-
Passaloecus singularis Dahlbom, 1844	+	-	-	+	-	+	-
Passaloecus turionum Dahlbom, 1844	-	-	+	-	-	-	+
Passaloecus vandeli Ribaut, 1952	-	-	-	-	+	-	+
Genus ***Pemphredon*** Latreille, 1796							
Pemphredon austriaca Kohl, 1888	+	-	-	+	+	+	+
Pemphredon inornata Say, 1824	+	-	-	+	+	-	+
Pemphredon lethifer (Shuckard, 1837)	+	+	+	+	+	+	+
Pemphredon lugens Dahlbom, 1842	-	-	-	+	+	-	+
Pemphredon lugubris (Fabricius, 1793)	+	-	+	+	-	-	+
Pemphredon morio Vander Linden, 1829	+	-	-	-	-	-	-
Pemphredon mortifer Valkeila, 1972	-	-	-	-	+	-	-
Pemphredon rugifer (Dahlbom, 1844)	+	-	+	+	+	+	+
Subtribe Spilomenina Menke, 1989							
Genus ***Spilomena*** Shuckard, 1838							
Spilomena mocsaryi Kohl, 1898	-	+	-	+	+	-	+
Spilomena punctatissima (Blüthgen, 1953)	-	-		-	+	-	-
Spilomena troglodytes (Vander Linden, 1829)	-	-	+	-	+	-	+
Subtribe Stigmina R. Bohart & Menke, 1976							
Genus ***Stigmus*** Panzer, 1804							
Stigmus solskyi A. Morawitz, 1864	-	-	+	+	-	-	-
Subfamily Mellininae Latreille, 1802							
Tribe Mellinini Latreille, 1802							
Subtribe Mellinina Latreille, 1802							
Genus ***Mellinus*** Fabricius, 1790							
Mellinus arvensis (Linnaeus, 1758)	+	-	-	-	-	-	+
Mellinus crabroneus (Thunberg, 1791)	-	-	-	-	-	-	+
Subfamily Dinetinae W. Fox, 1895							
Tribe Dinetini W. Fox, 1895							
Genus ***Dinetus*** Panzer, 1806							
Dinetus pictus (Fabricius, 1793)	+	-	+	+	+	-	+

Subfamily Crabroninae Latreille, 1802							
Tribe Palarini Schrottky, 1909							
Genus ***Palarus*** Latreille, 1802							
Palarus ambustus Klug, 1845	+	-	-	-	-	-	-
Palarus funerarius F. Morawitz, 1889	+	-	+	+	+	-	-
Palarus laetus Klug, 1845	-	+	-	-	-	-	-
Palarus variegatus (Fabricius, 1781)	+	+	+	+	-	+	+
Tribe Larrini Latreille, 1810							
Subtribe Larrina Latreille, 1810							
Genus ***Larra*** Fabricius, 1793							
Larra anathema (Rossi, 1790)	+	+	+	+	+	+	+
Genus ***Liris*** Fabricius, 1804							
Liris festinans praetermissus (Richards, 1928)	-	-	-	-	-	+	-
Liris inopinatus de Beaumont, 1961	-	-	+	-	-	-	-
Liris micans (Spinola, 1806)	-	-	-	+	-	-	-
Liris niger (Fabricius, 1775)	+	+	+	+	+	+	+
Liris nigricans (Walker, 1871)	+	-	-	-	+	-	-
Genus ***Ancistromma*** W. Fox, 1893							
Ancistromma asiaticum Gussakovskij, 1935	+	-	-	-	-	-	-
Subtribe Gastrosericina Ed. André, 1886							
Genus ***Gastrosericus*** Spinola, 1839							
Gastrosericus funereus Gussakovskij, 1931	-	+	-	-	+	-	-
Gastrosericus waltlii Spinola, 1839	+	+	-	+	+	-	-
Genus ***Holotachysphex*** de Beaumont, 1940							
Holotachysphex mochii (de Beaumont, 1947)	-	-	-	-	+	-	-
Genus ***Parapiagetia*** Kohl, 1896							
Parapiagetia genicularis (F. Morawitz, 1890)	+	-	-	-	-	-	-
Genus ***Prosopigastra*** A. Costa, 1867							
Prosopigastra bulgarica Puławski, 1958	+	-	-	+	+	-	-
Prosopigastra fumipennis Gussakovskij, 1952	-	+	+	+	+	+	-
Prosopigastra handlirschi Morice, 1897	-	-	-	-	+	-	-
Prosopigastra orientalis de Beaumont, 1947	+	-	+	+	+	-	+
Prosopigastra zalinda de Beaumont, 1955	-	-	+	+	+	+	-
Genus ***Tachysphex*** Kohl, 1883							
****Tachysphex agnus*** Puławski, 1971	-	-	-	+	-	-	-
Tachysphex albocinctus (Lucas, 1849)	-	-	-	-	+	+	-
****Tachysphex angustatus*** Puławski, 1967	+	+	+	+	-	-	-
Tachysphex argentatus Gussakovskij, 1952	-	+	-	+	+	-	-
****Tachysphex bouceki*** Straka, 2005	-	+	+	+	-	-	-
Tachysphex brevipennis Mercet, 1909	-	-	-	+	+	-	+
Tachysphex brullii brullii (F. Smith, 1856)	+	-	+	+	+	+	-
Tachysphex brullii galileus de Beaumont, 1947	+	-	-	+	+	-	-
Tachysphex consocius Kohl, 1894	+	+	-	+	+	+	+
Tachysphex coriaceus (A. Costa, 1867)	-	-	-	-	+	-	+
Tachysphex costae (De-Stefani Perez, 1881)	-	-	-	+	+	+	+
Tachysphex dignus Kohl, 1889	+	+	-	+	+	+	-
Tachysphex erythropus (Spinola, 1839)	-	-	-	-	+	+	-
Tachysphex euxinus Puławski, 1958	-	-	-	-	-	+	+
Tachysphex excelsus R. Turner, 1917	+	-	-	-	-	-	-
****Tachysphex ferrugineus*** Puławski, 1967	-	-	+	-	-	-	-
Tachysphex fugax (Radoszkowski, 1877)	+	+	+	-	-	-	+
Tachysphex fulvitarsis (A. Costa, 1867)	+	+	+	+	+	-	+
Tachysphex graecus Kohl, 1883	+	-	+	+	+	+	+
Tachysphex grandii de Beaumont, 1965	+	-	-	+	-	-	+
Tachysphex helveticus Kohl, 1885	+	-	-	+	+	-	+
****Tachysphex humilis*** Straka, 2005	+	+	-	+	+	+	-
Tachysphex incertus (Radoszkowski, 1877)	+	+	+	+	+	+	+
Tachysphex julliani Kohl, 1883	+	-	-	+	+	+	-

***Tachysphex karasi** Straka, 2005	-	+	-	-	+	-	-
***Tachysphex latifrons** Kohl, 1884	+	+	+	+	+	-	+
***Tachysphex liriformis** Puławski, 1967	+	+	-	+	+	-	-
***Tachysphex magnaemontis** Hensen, 1987	-	-	-	-	-	-	+
***Tachysphex mediterraneus** Kohl, 1883	-	-	+	+	+	+	+
***Tachysphex melas** Kohl, 1898	+	-	-	-	-	-	-
***Tachysphex minitus** Nurse, 1909	-	-	-	+	+	-	+
***Tachysphex mocsaryi** Kohl, 1884	+	+	-	+	-	-	+
***Tachysphex morawitzi** Puławski, 1971	+	-	+	-	-	-	-
***Tachysphex nasalis** F. Morawitz, 1893	+	-	-	-	-	-	-
***Tachysphex nitidior** de Beaumont, 1940	+	-	+	+	+	-	-
***Tachysphex nitidissimus** de Beaumont, 1952	+	+	+	+	+	+	-
***Tachysphex nitidus** (Spinola, 1806)	+	-	-	+	-	-	+
***Tachysphex obscuripennis** (Schenck, 1857)	+	-	+	+	-	-	-
***Tachysphex opacus** F. Morawitz, 1893	+	-	-	+	-	-	-
***Tachysphex panzeri** (Vander Linden, 1829)	+	+	+	+	+	+	+
***Tachysphex persa nigripes** Puławski, 1967	-	-	-	+	+	+	-
***Tachysphex persa persa** Gussakovskij, 1933	+	+	-	+	+	+	-
***Tachysphex picnic** Van Ooijen, 1987	-	-	-	-	-	-	+
***Tachysphex plicosus** (A. Costa, 1867)	-	+	-	-	+	-	-
***Tachysphex pompiliformis** (Panzer, 1805)	+	+	+	+	+	+	+
***Tachysphex prismaticus** Straka, 2005	+	-	-	-	-	-	-
***Tachysphex psammobius** (Kohl, 1880)	+	+	+	+	+	+	+
***Tachysphex pulcher** Puławski, 1967	+	+	+	+	-	-	-
***Tachysphex punctipes** Puławski, 1967	+	-	+	-	-	-	-
***Tachysphex pusulosus** de Beaumont, 1955	-	+	-	-	-	-	-
***Tachysphex radoszkowskyi** F. Morawitz, 1893	+	-	-	-	-	-	-
***Tachysphex schmiedeknechti** Kohl, 1883	-	-	-	-	+	-	-
***Tachysphex selectus** Nurse, 1909	-	+	-	-	+	-	+
***Tachysphex sericeus** F. Smith, 1856	-	+	-	-	+	-	-
***Tachysphex sordidus** (Dahlbom, 1845)	-	-	-	+	+	-	+
***Tachysphex stachi** de Beaumont, 1936	+	+	-	+	+	-	-
***Tachysphex subdentatus** F. Morawitz, 1893	+	-	-	+	+	+	-
***Tachysphex tarsinus** (Lepeletier de Saint Fargeau, 1845)	+	-	+	+	+	-	-
***Tachysphex tessellatus** (Dahlbom, 1845)	+	-	+	-	+	-	-
***Tachysphex unicolor** (Panzer, 1806)	+	+	-	+	+	+	+
***Tachysphex vulneraqtus** R. Turner, 1917	-	-	-	-	+	-	-
Genus ***Tachytes** Panzer, 1806							
***Tachytes argenteus** Gussakovskij, 1933	-	-	-	-	+	-	-
*Tachytes **bicolor** Brulle, 1833	-	-	-	+	-	-	-
***Tachytes etruscus** (Rossi, 1790)	+	-	+	-	+	-	+
***Tachytes freygessneri** Kohl, 1881	+	-	+	-	+	+	-
***Tachyetes integer** Gussakovskij, 1933	+	-	-	-	-	-	-
***Tachytes levantinus** Puławski, 1962	-	-	-	+	-	-	-
***Tachytes matronalis** Dahlbom, 1845	+	-	-	+	+	+	+
***Tachytes obsoletus** (Rossi, 1792)	+	-	-	+	-	-	-
***Tachytes panzeri** (Dufour, 1841)	+	-	-	+	+	+	-
***Tachytes tarsalis** (Spinola, 1839)	-	-	-	-	+	-	-
Tribe Miscophini W. Fox, 1895							
Genus ***Miscophus** Jurine, 1807							
***Miscophus albufeire anatolicus** de Beaumont, 1967	-	-	-	-	+	-	-
***Miscophus ater** Lepeletier de Saint Fargeau, 1845	-	-	-	-	-	-	+
***Miscophus bicolor** Jurine, 1807	-	-	-	+	+	+	
***Miscophus caninus** de Andrade, 1953	+	+	-	+	+	-	+
***Miscophus helveticus helveticus** Kohl, 1883	-	-	-	+	-	-	-
***Miscophus insolitus** de Andrade, 1953	-	-	+	-	-	-	-
***Miscophus luctuosus** de Andrade, 1960	-	-	-	-	+	-	-
***Miscophus lusitanicus** de Andrade, 1952	-	-	-	+	+	-	-

***Miscophus mavromoustakisi cappadocicus** de Beaumont, 1967	-	-	+	+	-	-	-
***Miscophus merceti orientalis** de Beaumont, 1967	-	-	-	+	-	+	-
***Miscophus minutus** de Andrade, 1953	-	-	-	-	+	-	-
***Miscophus niger** (Dahlbom, 1844)	-	-	-	-	+	-	-
***Miscophus pretiosus** Kohl, 1884	-	-	-	+	+	-	-
***Miscophus venustus** de Beaumont, 1969	-	-	+	-	-	-	-
Genus ***Nitela** Latreille, 1809							
***Nitela borealis** Valkeila, 1974	-	-	-	-	-	-	+
***Nitela fallax** Kohl, 1884	-	-	-	-	-	-	+
***Nitela spinolae** Latreille, 1809	-	-	+	-	-	-	-
***Nitela truncate** Gayubo & Felton, 2000	-	-	+	-	+	-	-
Genus ***Solierella** Spinola, 1851							
***Solierella compedita** (Piccioli, 1869)	-	+	-	+	+	+	-
***Solierella pisonoides** (S. Saunders, 1873)	-	-	-	+	-	-	-
***Solierella verhoeffi** de Beaumont, 1964	-	-	-	-	+	-	-
Tribe Trypoxylini Lepeletier de Saint Fargeau, 1845							
Genus ***Pison** Jurine, 1808							
***Pison fasciatum** (Radoszkowski, 1876)	-	-	-	-	+	+	-
***Pison sericeum** Kohl, 1888	-	-	+	+	+	+	+
Genus ***Trypoxylon** Latreille, 1796							
***Trypoxylon albipes** F. Smith, 1856	+	+	-	-	+	-	-
***Trypoxylon attenuatum** F. Smith, 1851	+	-	+	+	-	+	+
***Trypoxylon clavicerum** Lepeletier de Saint Fargeau & Audinet-Serville, 1828	-	-	+	+	-	+	+
***Trypoxylon deceptorium** Antropov, 1991	+	+	+	-	+	+	+
***Trypoxylon figulus** (Linnaeus, 1758)	+	-	+	+	+	+	+
***Trpoxylon fronticorne** (Gussakovskij,1936)	-	-	-	-	+	-	-
****Trypoxylon guichardi** Antropov, 1995	-	-	-	-	+	-	-
***Trypoxylon kolazyi** Kohl, 1893	+	-	-	+	+	-	-
***Trypoxylon kostylevi** (Antropov, 1985)	-	-	-	-	+	-	-
***Trypoxylon latilobatum** Antropov, 1991	+	-	-	-	-	-	+
***Trypoxylon megriense** Antropov, 1985	+	-	+	-	-	-	-
***Trypoxylon medium** de Beaumont, 1945	+	-	+	-	+	+	+
***Trypoxylon minus** de Beaumont, 1945	-	-	+	-	+	-	+
***Trypoxylon scutatum** Chevrier, 1867	+	+	+	+	+	-	+
***Trypoxylon syriacum** Mercet, 1906	+	-	-	-	-	-	-
Tribe Oxybelini Leach, 1815							
Genus ***Belomicrus** A. Costa, 1871							
***Belomicrus italicus** A. Costa, 1871	-	+	-	-	+	+	-
****Belomicrus lucifer** Guichard, 1991	+	-	-	+	-	-	-
***Belomicrus modestus** (Kohl, 1892)	-	+	-	-	-	-	-
***Belomicrus odontophorus** (Kohl, 1892)	+	-	-	-	-	-	-
****Belomicrus ottomanus** Guichard, 1991	-	-	-	+	-	-	-
****Belomicrus wouroukatte** de Beaumont, 1967	-	-	-	+	-	-	-
Genus ***Oxybelus** Latreille, 1796							
***Oxybelus aurantiacus** Mocsáry, 1883	+	+	-	+	+	+	-
***Oxybelus bipunctatus** Olivier, 1812	+	+	+	+	+	+	+
***Oxybelus dissectus dissectus** Dahlbom, 1845	+	+	-	+	+	+	+
***Oxybelus dissectus elegans** Mocsáry, 1879	+	-	+	+	+	+	-
***Oxybelus fischeri** Spinola, 1839	-	-	-	+	-	-	-
***Oxybelus haemorrhoidalis** Olivier, 1812	+	-	+	+	+	+	-
***Oxybelus lamellatus** Olivier, 1812	-	+	-	-	+	+	+
***Oxybelus latidens** Gerstaecker, 1867	+	-	-	+	-	-	-
***Oxybelus latifrons** Kohl, 1892	-	-	-	+	-	-	-
***Oxybelus latro** Olivier, 1812	+	+	+	+	+	+	+
***Oxybelus lineatus** (Fabricius, 1787)	+	-	+	+	+	+	-
***Oxybelus maculipes** F. Smith, 1856	+	+	+	+	+	+	+

Oxybelus mandibularis Dahlbom, 1845	+	-	+	-	+	-	-
Oxybelus mucronatus (Fabricius, 1793)	+	-	+	+	+	+	+
Oxybelus quatuordecimnotatus Jurine, 1807	+	+	+	+	+	+	+
Oxybelus subspinosus Klug, 1835	+	+	+	+	+	+	+
Oxybelus trispinosus (Fabricius, 1787)	-	-	+	-	-	-	-
Oxybelus uniglumis (Linnaeus, 1758)	+	+	+	+	-	+	-
Oxybelus variegatus Wesmael, 1852	+	-	+	+	+	+	+
Tribe Crabronini Latreille, 1802							
Subtribe Anacrabronina Ashmead, 1899							
Genus ***Entomognathus*** Dahlbom, 1844							
Entomognathus brevis (Vander Linden, 1829)	+	-	+	+	+	-	+
Entomognathus dentifer (Noskiewicz, 1929)	-	-	+	+	+	-	-
****Entomognathus schmidti*** de Beaumont, 1967	-	-	-	+	+	+	+
Entomognathus schmiedeknechti (Kohl, 1905)	+	-	+	+	+	+	-
Subtribe Crabronina Latreille, 1802							
Genus ***Crabro*** Fabricius, 1775							
Crabro alpinus Imhoff, 1863	-	-	+	-	-	-	-
Crabro cribrarius (Linnaeus, 1758)	+	-	+	+	-	+	+
Crabro peltarius (Schreber, 1784)	+	-	+	+	-	+	+
Crabro pugillator A. Costa, 1871	+	-	+	-	-	+	+
Genus ***Crossocerus*** Lepeletier de Saint Fargeau & Brullé, 1835							
Crossocerus (***Ablepharipus***) ***assimilis*** (F. Smith, 1856)	+	-	+	+	+	-	-
Crossocerus (***Ablepharipus***) ***podagricus*** (Vander Linden, 1829)	+	-	+	+	+	-	-
Crossocerus (***Acanthocrabro***) ***vagabundus*** (Panzer, 1798)	+	-	+	+	-	-	+
Crossocerus (***Blepharipus***) ***annulipes*** (Lepeletier de Saint Fargeau & Brullé, 1835)	-	-	+	-	-	-	-
Crossocerus (***Blepharipus***) ***barbipes*** (Dahlbom, 1845)	-	-	+	-	-	-	-
Crossocerus (***Blepharipus***) ***cetratus*** (Shuckard, 1837)	+	-	+	-	-	-	+
Crossocerus (***Blepharipus***) ***heydeni*** Kohl, 1880	+	-		-	-	-	-
Crossocerus (***Blepharipus***) ***leucostoma*** (Linnaeus, 1758)	-	-	+	-	-	-	-
Crossocerus (***Blepharipus***) ***megacephalus*** (Rossi, 1790)	+	-	+	-	-	-	+
Crossocerus (***Crossocerus***) ***adhaesus*** (Kohl, 1915)	-	-	-	-	+	-	-
****Crossocerus*** (***Crossocerus***) ***bispinosus*** de Beaumont, 1967	-	-	+	+	-	-	-
Crossocerus (***Crossocerus***) ***denticrus*** Herrich-Schaeffer, 1841	+	-	-	-	+	-	-
Crossocerus (***Crossocerus***) ***elongatulus annulatus*** Lepeletier de Saint Fargeau & Brullé, 1835	+	-	+	-	-	-	-
Crossocerus (***Crossocerus***) ***elongatulus elongatulus*** (Vander Linden, 1829)	+	-	+	+	+	+	+
****Crossocerus*** (***Crossocerus***) ***esau*** de Beaumont, 1967	+	-	-	+	-	-	-
Crossocerus (***Crossocerus***) ***palmipes*** (Linnaeus, 1767)	+	-	-	-	-	-	-
Crossocerus (***Crossocerus***) ***tarsatus*** (Shuckard, 1837)		+	+	+	+	+	+
Crossocerus (***Crossocerus***) ***varus*** Lepeletier de Saint Fargeau & Brullé, 1835	-	-	+	-	-	-	-
Crossocerus (***Crossocerus***) ***wesmaeli*** (Vander Linden, 1829)	+	-	-	-	+	-	-
Crossocerus (***Cuphopterus***) ***dimidiatus*** (Fabricius, 1781)	+	-	-	-	-	-	-
Crossocerus (***Hoplocrabro***) ***quadrimaculatus*** (Fabricius, 1793)	+	-	+	-	-	+	+
Crossocerus (***Oxycrabro***) ***acanthophorus*** (Kohl, 1892)	+	-	+	+	+	-	+
****Crossocerus*** (***Oxycrabro***) ***taru*** de Beaumont, 1967	-	-	-	+	-	-	-
Genus ***Ectemnius*** Dahlbom, 1845							
Ectemnius (***Cameronitus***) ***nigritarsus*** (Herrich-Schaeffer, 1841)	-	-	-	-	-	-	+
Ectemnius (***Clytochrysus***) ***lapidarius*** (Panzer, 1804)	+	-	+	-	-	-	+
Ectemnius (***Clytochrysus***) ***ruficornis*** (Zetterestedt, 1838)	+	-	+	-	-	-	-
Ectemnius (***Clytochrysus***) ***sexcinctus*** (Fabricius, 1775)	+	-	+	+	+	-	+
Ectemnius (***Ectemnius***) ***borealis*** (Zetterstedt, 1838)		-	+	-	-	-	-
Ectemnius (***Ectemnius***) ***dives*** (Lepeletier de Saint Fargeau & Brullé, 1835)	+	-	+	-	-	-	+
Ectemnius (***Ectemnius***) ***rugifer*** (Dahlbom, 1845)	+	-	+	+	-	+	-
Ectemnius (***Hypocrabro***) ***confinis*** (Walker, 1871)	+	+	+	+	+	+	+

Ectemnius* (*Hypocrabro*) *continuus continuus (Fabricius, 1804)	+	-	+	+	+	+	+
Ectemnius* (*Hypocrabro*) *continuus punctatus (Lepeletier de Saint Fargeau & Brullé, 1835)	-	-	+	-	-	+	-
Ectemnius* (*Hypocrabro*) *hypsae (De-Stefani, 1884)	+	-	-	+	-	-	-
Ectemnius* (*Hypocrabro*) *meridionalis (A. Costa, 1871)	+	+	+	+	+	+	+
Ectemnius* (*Hypocrabro*) *persicus (Kohl, 1888)	+	-	-	-	-	-	-
Ectemnius* (*Hypocrabro*) *rubicola (Dufour & Perris, 1840)	+	-	+	-	-	-	+
Ectemnius* (*Hypocrabro*) *walteri (Kohl, 1889)	+	-	-	+	-	-	-
Ectemnius* (*Metacrabro*) *cephalotes (Olivier, 1792)	+	-	+	+	+	-	+
Ectemnius* (*Metacrabro*) *fossorius (Linnaeus, 1758)	+	-	+	-	-	-	-
Ectemnius* (*Metacrabro*) *kriechbaumeri (Kohl, 1879)	+	+	-	-	+	-	-
Ectemnius* (*Metacrabro*) *lituratus (Panzer, 1805)	+	-	+	-	-	-	+
Ectemnius* (*Thyreocerus*) *crassicornis (Spinola, 1808)	+	+	+	+	+	+	+
Ectemnius* (*Thyreocerus*) *massiliensis (Kohl, 1883)	+	+	+	+	+	+	-
Genus ***Lestica*** Billberg, 1820							
Lestica* (*Lestica*) *alata (Panzer, 1797)	-	-	-	-	-	-	+
Lestica* (*Lestica*) *pluschtschevskyi (F. Morawitz, 1891)	+	-	-	-	-	-	-
Lestica* (*Lestica*) *subterranea (Fabricius, 1775)	+	-	+	+	+	+	-
Lestica* (*Ptyx*) *eurypus (Kohl, 1898)	+	-	-	-	+	-	-
Lestica* (*Solenius*) *camelus (Eversmann, 1849)	-	-	-	+	-	-	-
Lestica* (*Solenius*) *clypeata (Schreber, 1759)	+	+	+	+	+	+	+
Genus ***Lindenius*** Lepeletier de Saint Fargeau & Brullé, 1835							
Lindenius albilabris (Fabricius, 1793)	+	-	+	+	+	-	+
****Lindenius anatolicus*** de Beaumont, 1967	-	+	-	+	+	+	-
Lindenius aptus Marshakov, 1973	+	-	-	-	-	-	-
Lindenius crenulifer (Kohl, 1905)	-	+	-	-	+	-	-
****Lindenius fastidiosus*** de Beaumont, 1967	-	-	-	+	-	-	-
Lindenius helleri (Kohl, 1915)	+	-	-	-	-	-	-
Lindenius ibex ibex Kohl, 1883	+	+	-	+	+	+	-
Lindenius ibex syriacus (Kohl, 1905)	+	+	-	-	+	-	-
Lindenius iranius Leclercq, 1975	+	+	-	+	+	-	-
Lindenius laevis A. Costa, 1871	+	-	+	-	-	-	+
Lindenius latitarsis Marshakov, 1973	+	-	-	-	-	-	-
Lindenius mesopleuralis (F. Morawitz, 1891)	+	-	-	-	-	-	-
****Lindenius nitidus*** de Beaumont, 1967	-	-	-	+	-	-	-
Lindenius panzeri (Vander Linden, 1829)	+	-	-	+	+	+	+
Lindenius parkanensis (Zavadil, 1948)	-	-	-	+	-	-	-
Lindenius pygmaeus armatus (Vander Linden, 1829)	+	+	+	+	+	-	+
Lindenius pygmaeus pygmaeus (Rossi, 1794)	+	-	-	+	-	-	-
Lindenius sardashti Leclercq, 1975	+	+	-	-	-	-	-
Lindenius satschouanus (Kohl, 1915)	+	-	-	-	-	-	-
Lindenius subaeneus Lepeletier de Saint Fargeau & Brullé, 1835	+	-	-	+	+	-	-
Genus ***Odontocrabro*** Tsuneki, 1971							
****Odontocrabro orthodoxus*** Hensen, 1989	-	+	-	-	-	-	-
Genus ***Rhopalum*** Stephens, 1829							
Rhopalum* (*Corynopus*) *coarctatum (Scopoli, 1763)	+	-	+	-	-	-	-
Rhopalum* (*Rhopalum*) *austriacum (Kohl, 1899)	-	-	-	-	-	-	+
Rhopalum* (*Rhopalum*) *beaumonti Móczár, 1957	+	-	-	-	-	-	-
Rhopalum* (*Rhopalum*) *gracile (Wesmael, 1852)	+	-	+	-	-	-	-
Genus ***Tracheliodes*** A. Morawitz, 1866							
Tracheliodes quinquenotatus (Jurine, 1807)	+	-	-	-	-	+	-
Total genera	**54**	**35**	**49**	**51**	**50**	**46**	**43**
Total species	**313**	**142**	**211**	**259**	**273**	**157**	**165**
Total species and subspecies	**322**	**144**	**215**	**265**	**278**	**160**	**165**

Remarks: EA- Eastern Anatolia, **SA**- Southeastern Anatolia, **BS**- Black Sea, **CA**- Central Anatolia, **MD**- Mediterranean, **A-** Aegean, **M**- Marmara.

There are great differences in species composition and richness between the biogeographic regions of Turkey (Table 2, Fig. 2). In this study, 313 species and 9 subspecies of the Crabronidae have been recorded from Eastern Anatolia (62.3% of the recorded species and subspecies), 273 species and 5 subspecies from Mediterranean (53,8%), 259 species and 6 subspecies from Central Anatolia (51.2%), 211 species and 4 subspecies from Black Sea (41.6%), 165 species from Marmara region (31.9%), 157 species and 3 subspecies from the Aegean (30,9%), and 142 species and 2 subspecies from Southeastern Anatolia (27.8%). The diversity of species (313) and genera (54) is highest in the Eastern Anatolia region.

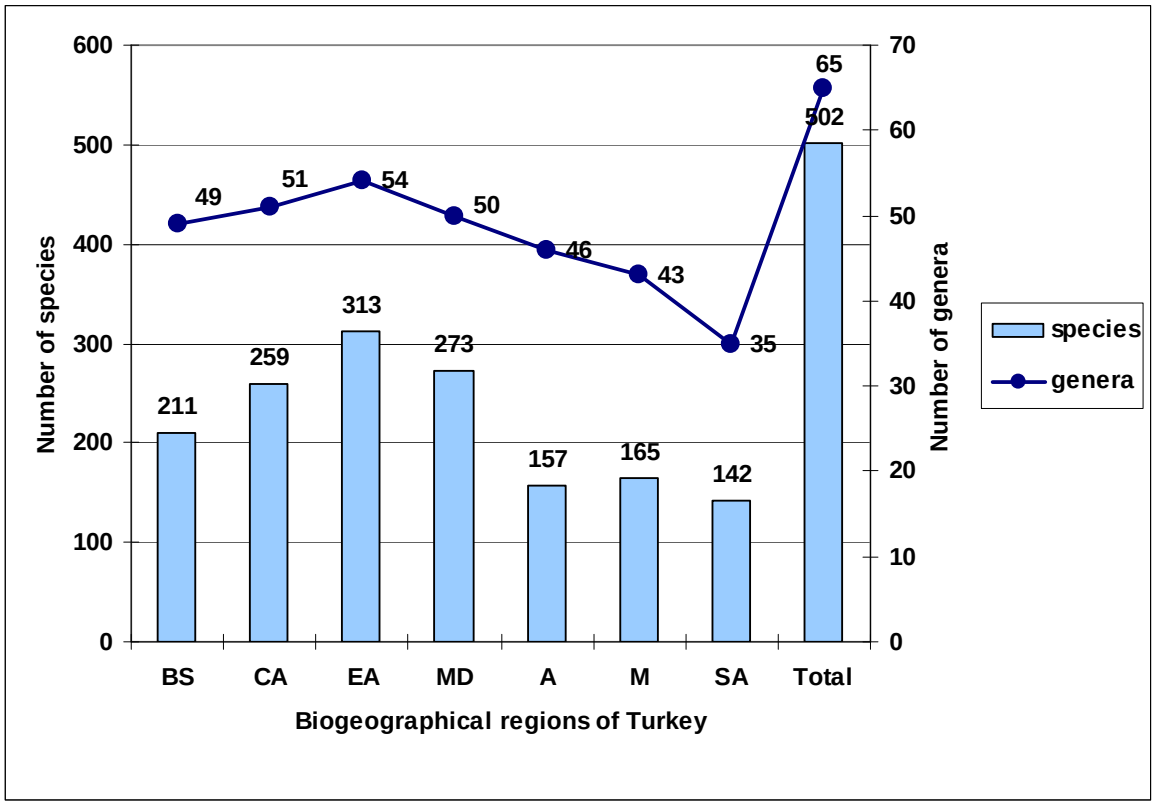

Figure 2. Number of species and genera of Crabronidae in the biogeographical regions of Turkey (**EA** - Eastern Anatolia, **SA** - Southeastern Anatolia, **BS** - Black Sea, **CA** - Central Anatolia, **MD** - Mediterranean, **A** - Aegean, **M** - Marmara).

The cluster analysis of faunal similarities on Crabronidae among seven biogeographical regions of Turkey produce three major clusters (Fig. 3): Marmara and Aegean (bootstrap probability 31%) and Central Anatolia, Eastern Anatolia, Mediterranean and Black Sea (bootstrap probability 45%), which unit in one (bootstrap probability 99%). This united large cluster belongs to East Mediterranean province of Palaearctic (the division of Palaearctic follows Semenov-Tian-Shanskij 1935). Southeast Anatolia demonstrates minimal similarity (0.42) with other Turkish fauna and belongs to Sumerian province of Palaearctic (Syrian province of Sethian Region according to Emeljanov 1974). In other cluster analyses (Mutillidae, Pompilidae, Vespidae) (Yıldırım & Lelej 2012) Southeast Anatolia has minimal similarity (0.2, 0.45, and 0.3 respectively) with other Turkish fauna. East Anatolian and Central Anatolian faunas have highest similarity (0.7) and include most of the Crabronidae species occurring in Turkey. In other cluster analyses East Anatolian and Central Anatolian fauna have highest similarity among Mutillidae, Pompilidae, Vespidae (0.5, 0.75, and 0.7 correspondently (Yıldırım & Lelej 2012). The ordination of the seven

biogeographical regions of Turkey in the reduced space of the first two principal coordinates for 502 species of Crabronidae see Figure 4.

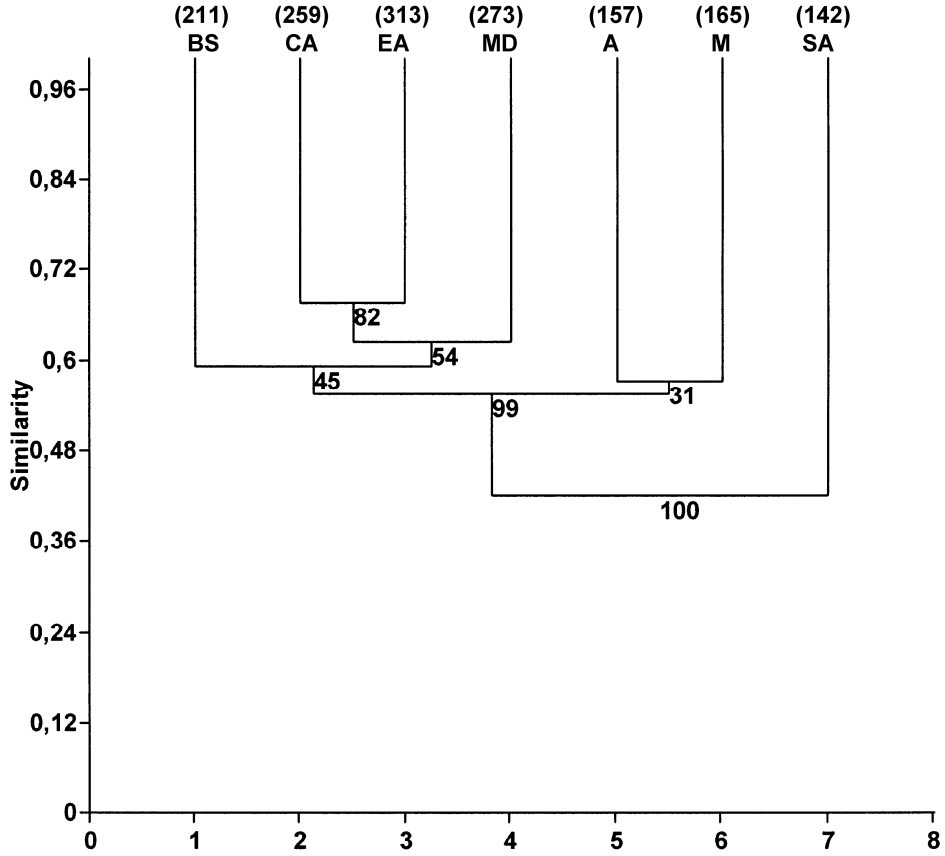

Figure 3. Similarity of 502 species of Crabronidae from seven biogeographical regions of Turkey. (Dice, r = 0.88). Bootstrap probabilities (expressed in percentages) are indicated at node of each cluster (Names of regions: **A** – Aegean, **BS** – Black Sea, **CA** – Central Anatolia, **EA** – Eastern Anatolia, **M** – Marmara, **MD** – Mediterranean, **SA** – Southeastern Anatolia).

As a result, a total of 502 species and 15 subspecies of 65 genera belonging to seven subfamilies (Astatinae, Bembecinae, Philanthinae, Pemphredoninae, Mellininae, Dinetinae and Crabroninae) of Crabronidae were recorded from Turkey. Among them, 44 species and 6 subspecies comprising 9,7% of Turkish crabronids are endemic. Furthermore, the type localities of 69 species and 10 subspecies of Crabronidae are located in Turkey. The following species have been found to be the most abundant and widespread in all biogeographic regions (Table 2): *Gorytes pleuripunctatus* (A. Costa, 1859), *G. quinquecinctus* (Fabricius, 1793), *G. quinquefasciatus* (Panzer, 1798), *G. schmiedeknechtii* Handlirsch, 1888, *Ammatomus coarctatus* (Spinola, 1808), *A. rogenhoferi* (Handlirsch, 1888), *Bembecinus peregrinus* (F. Smith, 1856), *B. tridens* (Fabricius, 1781), *Philanthus triangulum* (Fabricius, 1775), *Cerceris flavicornis* Brullé, 1833, *C. lunata* A. Costa, 1867, *C. sabulosa* (Panzer, 1799), *Psenulus pallipes* (Panzer, 1798), *Diodontus minutus* (Fabricius, 1793), *Pemphredon lethifer* (Shuckard, 1837), *Larra anathema* (Rossi, 1790), *Liris niger* (Fabricius, 1775), *Tachysphex incertus* (Radoszkowski, 1877), *T. panzeri* (Vander Linden, 1829), *T. pompiliformis* (Panzer, 1805), *T. psammobius* (Kohl, 1880), *Oxybelus quatuordecimnotatus* Jurine, 1807, *O. subspinosus* Klug, 1835, *Crossocerus elongatulus*

(Vander Linden, 1829), *Ectemnius confinis* (Walker, 1871), *E. meridionalis* (A. Costa, 1871), *E. crassicornis* (Spinola, 1808) and *Lestica clypeata* (Schreber, 1759).

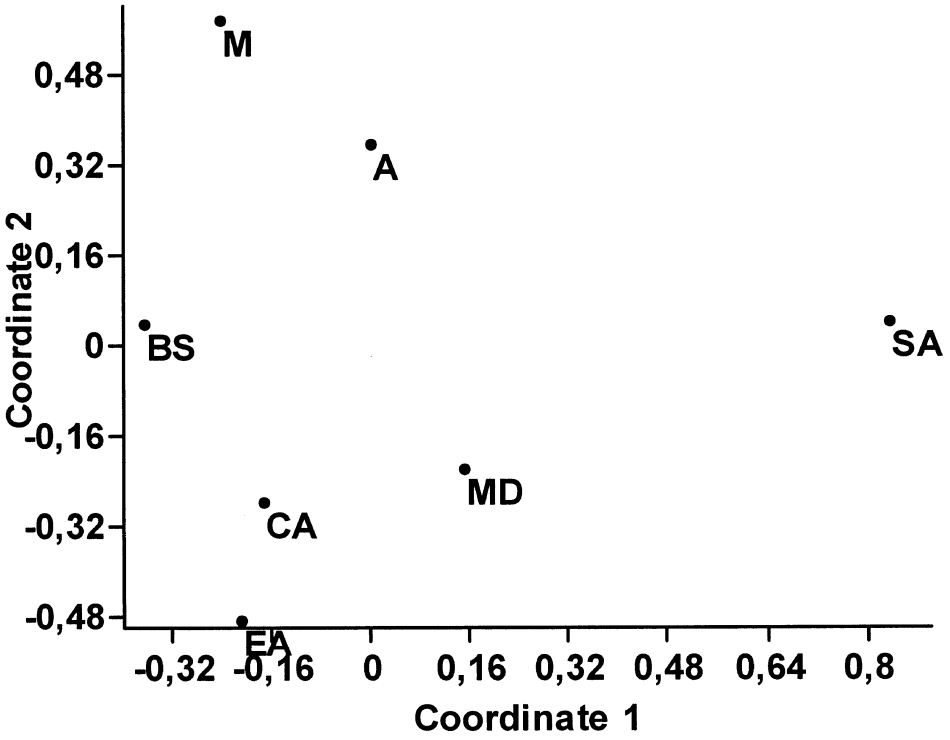

Figure 4. Ordination of the seven biogeographical regions of Turkey in the reduced space of the first two principal coordinates for 502 species of Crabronidae. (Dice, r = 0.88). For names of regions see Figure 3.

Moreover, 44 species and 6 subspecies are endemic. They are *Astata diversipes* Puławski, 1955, *A. leila* Puławski, 1967, *Dryudella tricolor anatolica* (Puławski, 1967), *Alysson ocellatus* de Beaumont, 1967, *Didineis latro* (de Beaumont, 1967), *Nippononysson inexpectatus* de Beaumont, 1967, *Nysson inornatus* de Beaumont, 1967, *N. trichopygus* de Beaumont, 1967, *Gorytes schlettereri ponticus* de Beaumont, 1967, *G. schmidti* Schmid-Egger, 2002, *Harpactus adventicus* (de Beaumont, 1967), *H. dimorphus* (Puławski, 1979), *H. obscurus* (de Beaumont, 1969), *H. osdroene* (de Beaumont, 1969), *Oryttus concinnus paradisiacus* (de Beaumont, 1967), *Bembecinus anatolicus* de Beaumont, 1968, *B. birecikensis* Schmid-Egger, 2004, *B. guichardi* Schmid-Egger, 2004, *B. gusenleitneri* de Beaumont, 1967, *B. heinrichi* Schmid-Egger, 2004, *B. henseni* Schmid-Egger, 2004, *B. innocens* de Beaumont, 1967, *B. nigrolabrum* Schmid-Egger, 2004, *B. schwarzi* de Beaumont, 1967, *B. urfanensis* Schmid-Egger, 2004, *Bembix ciliciensis* de Beaumont, 1967, *Cerceris eversmanni warnckei* K. Schmidt, 2000, *C. inara* de Beaumont, 1967, *C. maculicrus* de Beaumont, 1967, *C. seleukos* K. Schmidt, 2000, *C. spinifera haladai* K. Schmidt, 2000, *C. stratonike* K. Schmidt, 2000, *Lithium jacobsi* Schmid-Egger, 2007, *Ammoplanus denesi* Bouček, 2001, *Tachysphex bouceki* Straka, 2005, *T. karasi* Straka, 2005, *T. magnaemontis* Hensen, 1987, *T. picnic* Van Ooijen, 1987, *T. punctipes* Puławski, 1967, *Miscophus mavromoustakisi cappadocicus* de Beaumont, 1967, *M. merceti orientalis* de Beaumont, 1967, *M. venustus* de Beaumont, 1969, *Trypoxylon guichardi* Antropov, 1995, *Belomicrus ottomanus* Guichard, 1991, *B. wouroukatte* de Beaumont, 1967, *Entomognathus schmidti* de Beaumont, 1967, *Crossocerus taru* de Beaumont, 1967, *Lindenius fastidiosus* de Beaumont, 1967, *L. nitidus* de Beaumont, 1967, and *Odontocrabro orthodoxus* Hensen, 1989 (Table 3).

Table 3. Distribution of endemic species and subspecies in Biogeographic Regions in Turkey.

Names of taxa	EA	SA	BS	CA	MD	A	M
Astata diversipes Puławski, 1955	+	-	-	-	+	-	-
Astata leila Puławski, 1967	-	-	-	+	-	-	-
Dryudella tricolor anatolica (Puławski, 1967)	+	-	+	+	-	-	-
Alysson ocellatus de Beaumont, 1967	-	-	+	-	-	-	-
Didineis latro (de Beaumont, 1967)	-	-	-	-	+	-	-
Nippononysson inexpectatus de Beaumont, 1967	-	-	+	-	-	-	-
Nysson inornatus de Beaumont, 1967	-	-	-	-	+	-	-
Nysson trichopygus de Beaumont, 1967	-	-	-	-	+	-	-
Gorytes schlettereri ponticus de Beaumont, 1967	+	-	+	-	-	-	-
Gorytes schmidti Schmid-Egger, 2002	-	+	-	-	-	-	-
Harpactus adventicus (de Beaumont, 1967)	-	-	-	+	-	-	-
Harpactus dimorphus (Puławski, 1979)	-	+	-	-	-	-	-
Harpactus obscurus (de Beaumont, 1969)	-	-	-	+	-	-	-
Harpactus osdroene (de Beaumont, 1969)	-	+	-	-	-	-	-
Oryttus concinnus paradisiacus (de Beaumont, 1967)	+	-	-	-	-	+	-
Bembecinus anatolicus de Beaumont, 1968	-	+	+	+	+	-	-
Bembecinus birecikensis Schmid-Egger, 2004	-	+	-	-	-	-	-
Bembecinus guichardi Schmid-Egger, 2004	+	+	-	-	-	-	-
Bembecinus gusenleitneri de Beaumont, 1967	-	-	+	+	+	+	-
Bembecinus heinrichi Schmid-Egger, 2004	-	+	-	-	+	-	-
Bembecinus henseni Schmid-Egger, 2004	-	+	-	-	-	-	-
Bembecinus innocens de Beaumont, 1967	+	+	-	+	+	-	-
Bembecinus nigrolabrum Schmid-Egger, 2004	+	-	-	+	-	-	-
Bembecinus schwarzi de Beaumont, 1967	-	-	-	-	+	+	
Bembecinus urfanensis Schmid-Egger, 2004	-	+	-	-	-	-	-
Bembix ciliciensis de Beaumont, 1967	-	-	-	-	+	-	-
Cerceris eversmanni warnckei K. Schmidt, 2000	+	+	-	-	-	-	-
Cerceris inara de Beaumont, 1967	+	+	-	+	+	-	-
Cerceris maculicrus de Beaumont, 1967	-	-	-	-	+	+	
Cerceris seleukos K. Schmidt, 2000	+	+	-	-	+	-	-
Cerceris spinifera haladai K. Schmidt, 2000	-	+	-	-	-	-	-
Cerceris stratonike K. Schmidt, 2000	+	+	-	+	+	-	-
Lithium jacobsi Schmid- Egger, 2007	-	+	-	-	+	-	-
Ammoplanus denesi Bouček, 2001	-	+	-	-	-	-	-
Tachysphex bouceki Straka, 2005	-	+	+	+	-	-	-
Tachysphex karasi Straka, 2005	-	+	-	-	+	-	-
Tachysphex magnaemontis Hensen, 1987	-	-	-	-	-	-	+
Tachysphex picnic Van Ooijen, 1987	-	-	-	-	-	-	+
Tachysphex punctipes Puławski, 1967	+	-	+	-	-	-	-
Miscophus mavromoustakisi cappadocicus de Beaumont, 1967	-	-	+	+	-	-	-
Miscophus merceti orientalis de Beaumont, 1967	-	-	-	+	-	+	-
Miscophus venustus de Beaumont, 1969	-	-	+	-	-	-	-
Trypoxylon guichardi Antropov, 1995	-	-	-	-	+	-	-
Belomicrus ottomanus Guichard, 1991	-	-	-	+	-	-	-
Belomicrus wouroukatte de Beaumont, 1967	-	-	-	+	-	-	-
Entomognathus schmidti de Beaumont, 1967	-	-	-	+	+	+	+
Crossocerus (***Oxycrabro***) ***taru*** de Beaumont, 1967	-	-	-	+	-	-	-
Lindenius fastidiosus de Beaumont, 1967	-	-	-	+	-	-	-
Lindenius nitidus de Beaumont, 1967	-	-	-	+	-	-	-
Odontocrabro orthodoxus Hensen, 1989	-	+	-	-	-	-	-
Total species and subspecies	**12**	**20**	**10**	**19**	**18**	**6**	**3**

Remarks: EA- Eastern Anatolia, **SA**- Southeastern Anatolia, **BS**- Black Sea, **CA**- Central Anatolia, **MD**- Mediterranean, **A-** Aegean, **M**- Marmara.

There are great differences in endemic species composition and richness between the biogeographic regions of Turkey (Table 3, Fig. 5). In this study, 20 species and subspecies of Crabronidae have been recorded from Southeastern Anatolia (14,1% of the regional number of species), 19 from Central Anatolia (7,3%), 18 from Mediterranean (7,0%), 12 from Eastern Anatolia (3,8%), 10 from Black Sea (4,7%), 6 from the Aegean (3,8%), and 3 from Marmara region (1,8%). The number of endemic species is highest in the Southeastern Anatolia region. Southeastern Anatolian fauna of Crabronidae belongs to the Sumerian province of Palaearctic and demonstrates minimal similarity (0,4) with other regions of Turkey.

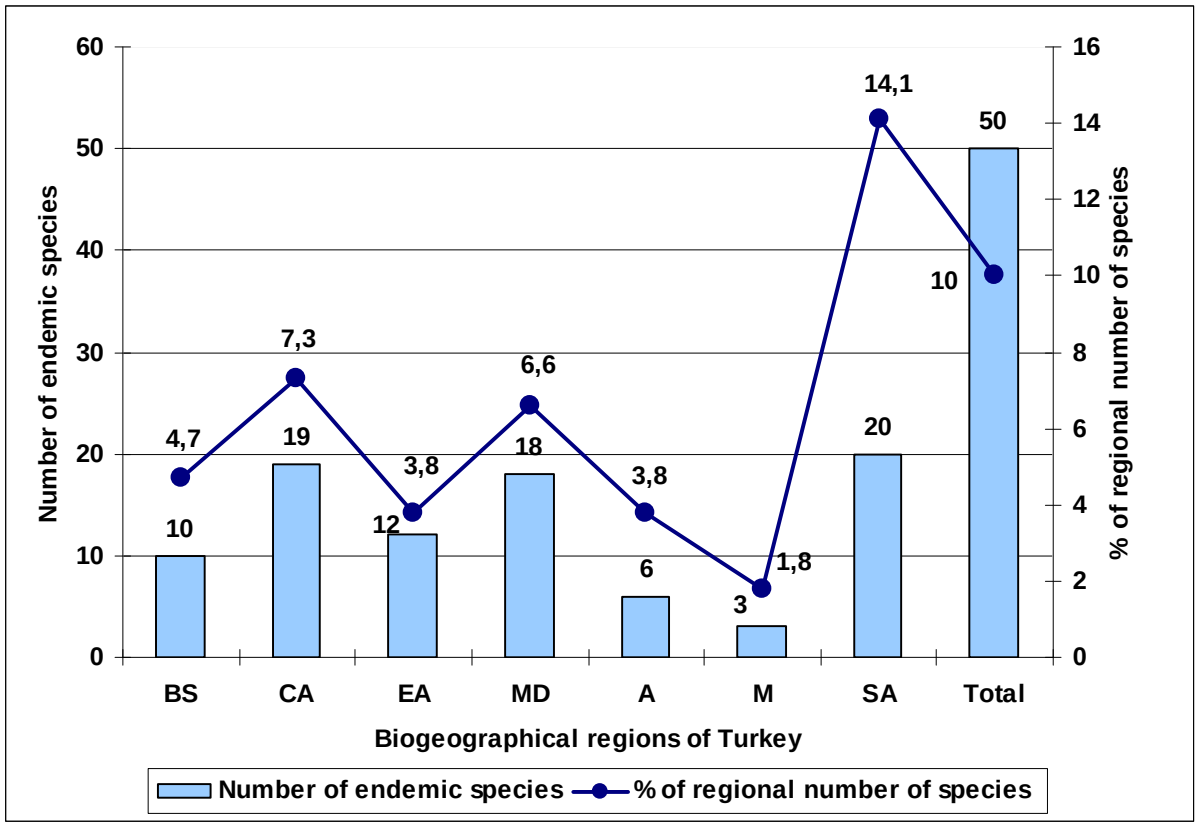

Figure 5. Number of endemic species and subspecies of Crabronidae in the biogeographical regions of Turkey

Turkish crabronid fauna can be considered as very rich. The fauna of the Crabronidae of Turkey contains a large number of species in comparison to others countries of the Mediterranean region, which are well known for their high biodiversity. The highest number of species is known from the biogeographical province of Turkey. Turkish crabronid fauna is very rich. The great richness and diversity of the Turkish crabronid fauna is the result of the various topographic and climatic structure of the country. In other hand, Turkey is a boundary of East Mediterranean, Sumerian and Irano-Turanian provinces of Palaearctic region that caused the richness of the fauna.

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