

Annotated checklist of Iranian Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae and Xiphydriidae (Hymenoptera: Symphyta)

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Abstract: The present work reports the results of an attempt to catalogue the fauna of Iranian Symphyta (Hymenoptera), based on known literature. In total, 27 species of Symphyta belonging to six families are listed: Cimbicidae (six species), Megalodontesidae (eight species), Orussidae (two species), Pamphiliidae (seven species), Siricidae (two species) and Xiphydriidae (two species). Three species are new records for Iran.

Key words: Sawflies, fauna, catalogue, distribution, new records, Iran.

Lista de verificación anotada de Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae y Xiphydriidae iraníes (Hymenoptera: Symphyta)

Resumen: El presente trabajo informa los resultados de un intento de catalogar la fauna de Symphyta iraní (Hymenoptera), basado en la literatura conocida a la fecha. En total, se enumeran 27 especies de Symphyta pertenecientes a seis familias: Cimbicidae (seis especies), Megalodontesidae (ocho especies), Orussidae (dos especies), Pamphiliidae (siete especies), Siricidae (dos especies) y Xiphydriidae (dos especies). Tres especies son nuevos registros para Irán.

Palabras clave: Sawflies, fauna, catálogo, distribución, nuevo record, Iran.

INTRODUCTION

Hymenoptera is one of the largest taxon of insects with more than 153.000 species (Wang *et al.*, 2015). Suborder Symphyta (sawflies and woodwasps) contains six superfamilies and 14 families: Cephoidea (Cephidae), Pamphiloidea (Megalodontesidae, Pamphiliidae), Orussoidea (Orussidae), Siricoidea (Anaxyelidae, Siricidae), Tenthredinoidea (Argidae, Blasticotomidae, Cimbicidae, Diprionidae, Pergidae, Tenthredinidae) and Xyeloidea (Xyelidae). Xiphydriidae are generally considered as members of Siricoidea (Taeger & Blank, 2010) but Vilhelmsen (2001) proposes a superfamily Xiphydrioidea, and Goulet (1992) considers it as a group related to Orussidae. The most of species are phytophagous, feeding on leaves, gall-makers and wood- and stem-borers on vascular plants (both monocots and dicots) - Equisetopsida, Polypodiopsida, Gymnosperms and Angiosperms - one sp. feeds on Bryophyta, except

Orussidae, which are parasitic on wood-boring larvae of Hymenoptera and Coleoptera (Heraty, 2011; Skvarla *et al.*, 2016).

Cimbicidae are a small family of stout-bodied, often hairy sawflies with only about 190 species in 14 genera worldwide (Taeger & Blank, 2010). The family is distinctive in having capitate (club-like) antennae with six or seven segmented antennae (Gussakovskij, 1935; Viitasaari, 2002; Lelej & Taeger, 2007). The adults of some species are among the largest and heaviest Hymenoptera (Goulet, 1993; Çalmaşur, 2011). Larvae are solitary herbivores and feed on plants of the families Rosaceae, Betulaceae, Fagaceae, Salicaceae, Caprifoliaceae, and Dipsacaceae (Bolton & Gauld, 1988).

Megalodontesidae is a small family and comprise only one extant genus, *Megalodontes* Latreille, 1803, distributed in Eurasia and restricted to the temperate regions, containing about 88 described species (Teager, 2002; Taeger *et al.*, 2010). The larvae feed on herbaceous plants (Apiaceae, Lamiaceae and Rutaceae). They are distinguished from the closely related Pamphiliidae by their serrate or pectinate antennae (Goulet, 1993; Wang *et al.*, 2015).

The Orussidae (Parasitic wood wasps) is a small family of parasitic wasps, comprising 85 extant and four fossil species worldwide (Blank *et al.*, 2012). Orussidae is the sister taxon of the apocritan wasps (Vilhelmsen, 2001). Orussidae is a monophyletic family. Tribes and subfamilies within the Orussidae have not been supported in phylogenetic analyses (Vilhelmsen, 2003; Taeger *et al.*, 2010). Larval biology of a few species is known. Orussidae are parasitoids of some larvae of beetles or Hymenoptera, particularly Buprestidae, Cerambycidae, Siricidae and Xiphydriidae.

The family Pamphiliidae with ten extant genera has over 330 described species (Taeger *et al.*, 2010). Also Pamphiliidae has eight extinct species in four genera described from the Mesozoic, Paleogene and Neogene (Nel, 2004; Wang *et al.*, 2015). These insects are restricted to temperate regions of North America and Eurasia. Their larvae typically feed on conifers, spinning silk tubes or nests (Cephalciinae), or rolling angiosperm leaves to form tubes or nests -*Neurotoma* (Pamphiliinae), where they feed (Achterberg & Aartsen, 1986; Viitasaari, 2002; Wang *et al.*, 2015).

Siricidae (Horntails) contains about 122 species worldwide within 10 (11 according to Taeger & Blank, 2010) extant genera. The siricid wood wasps are fairly large, cylindrical insects; usually 20 mm. or more in length. These are important wood-boring insects which adults and larvae are often intercepted at ports and are of concern as potential alien invasive species (Smith & Schiff, 2002; Schiff *et al.*, 2012). Females (with mycangia) usually oviposit in trees weakened or dying as a result of fire, disease, or other injury. The larvae bore into the trunk of the tree, making perfectly cylindrical holes in the wood and pack the frass from their borings in the tunnels behind them (Middlekauff, 1960).

Xiphydriidae with about 140 described species has a worldwide distribution - mainly restricted to the Northern Hemisphere (with a few Neotropical species)

excepting sub-Saharan Africa (Jennings *et al.*, 2009; Turrisi, 2010). They are a family of wood wasps with the distinct characteristic of having globose heads and long propleura, skinny "necks"; they are also unusual in the habit of boring into dead wood, rather than living trees (Smith, 1976, 2008). All known Xiphydriid larvae are woodborers (Smith & Middlekauff, 1987). Larvae develop in the wood of angiosperms, generally in small branches of Aceraceae, Betulaceae, Salicaceae, and Ulmaceae (Smith, 1976; Kraus, 1997). The development of larvae is supported by symbiotic fungi living in tunnels (Kajimura, 2000; Turrisi, 2010).

The fauna of Iranian Symphyta was poorly studied (e.g. Zirngiebl, 1956, Benson, 1968, Ebrahimi, 1995; Shamohammadi *et al.*, 2008; Samin & Farzaneh, 2016; Khayrandish *et al.*, 2017; Khayrandish & Ebrahimi, 2018). Additionally, Budak *et al.* (2018) and Ghahari *et al.* (2019) listed 15 and 21 species for Iranian Cephidae and Argidae, respectively. The aim of this paper is cataloguing of all the data of Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae and Xiphydriidae (Hymenoptera: Symphyta) from Iran.

MATERIAL AND METHODS

The published data (1881-2018) on the families Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae and Xiphydriidae (Hymenoptera: Symphyta) in Iran are summarized. The catalogue comprises the following data: the valid taxa name, published records with provincial distribution, or where this information is not available – "Iran (no locality cited)" is given, general distribution. Additionally, five new record specimens were collected during 2009-2012 by Malaise traps and sweeping from three provinces, Kordestan, Lorestan and West Azarbaijan. The specimens were identified by Benson (1951, 1952, 1958), Smith (1979), Zhelochovtsev (1988), Wright (1990) and Goulet (1993). Nomenclature, classification and distribution data follow Teager *et al.* (2010, 2018).

RESULTS

In total, 27 species within six families of Symphyta, Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae and Xiphydriidae are listed as the fauna of Iran. Three species, *Megalodontes cephalotes* (Fabricius, 1781) (Megalodontesidae), *Pamphilius betulae* (Linnaeus, 1758) and *Pamphilius sylvaticus* (Linnaeus, 1758) (Pamphiliidae) are new records for Iran. The list of species is given below alphabetically with distribution data and host records.

Family Cimbicidae Kirby, 1837

Subfamily Abiinae Benson, 1951

Genus *Abia* Leach, 1817

Abia candens Konow, 1887

Abia candens Konow, 1887; *Abia* (*Zaraea*) *candens* Konow, 1887; *Zaraea candens* (Konow, 1887); *Abia symballophthalma* Semenov, 1892; *Abia* (*Abia*)

symballophthalma Semenov, 1892; *Abia* (*Abia*) *candens* forma *subopaca* Kangas, 1946.

Distribution in Iran: Guilan (Khayrandish & Ebrahimi, 2018).

General distribution: Austria, Belarus, Belgium, Bulgaria, China, Croatia, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Spain, Switzerland, Ukraine (Taeger *et al.*, 2018).

Host plants: *Knautia maxima* (Linnaeus) (Savina & Liston, 2009), *Knautia arvensis* (Caprifoliaceae) (Taeger & Blank, 1998).

***Abia sericea* (Linnaeus, 1767)**

Cimbex (*Abia*) *nitens* (Linnaeus, 1758); *Tenthredo nitens* Linnaeus, 1758 [not 1802]; *Abia serica* (Linnaeus, 1767); *Cimbex sericea* (Linnaeus, 1767); *Cimbex* (*Abia*) *sericea* (Linnaeus, 1767); *Tenthredo sericea* Linnaeus, 1767; *Tenthredo* (*Cimbex*) *sericea* Linnaeus, 1767; *Zaraea sericea* (Linnaeus, 1767); *Zarea sericea* (Linnaeus, 1767); *Cimbex sericeus* (Linnaeus, 1767); *Cimbex nitens* Fallen, 1808; *Abia dorsalis* Costa, 1859.

Distribution in Iran: Guilan (Ebrahimi, 1995), Lorestan, Mazandaran (Mallach, 1931), Northern Iran (Dadurian, 1962).

General distribution: Austria, Belgium, Bosnia and Herzegovina, Bulgaria, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Macedonia, Netherlands, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine (Çalmaşur 2011; Taeger *et al.* 2018).

Host plants: *Dipsacus* sp. *Succisa pratensis*, *Knautia arvensis* (Caprifoliaceae), *Fragaria* sp. (Rosaceae) (Ebrahimi, 1995; Zhelochovtsev, 1988; Liston, 1995; Tager & Blank, 1998; Savina & Liston, 2009).

Subfamily Cimbicinae Leach, 1817

Genus *Cimbex* Olivier, 1790

***Cimbex femoratus* (Linnaeus, 1758)**

Cimbex russa Eversmann; *Tenthredo russa* Panzer; *Cimbex variabilis* var. *russa* Panzer; *Cimbex femorata* (Linnaeus, 1758); *Tenthredo femorata* Linnaeus, 1758; *Tenthredo* (*Cimbex*) *femorata* Linnaeus, 1758; *Cimbex femorata femorata* Linnaeus, 1758; *Cimbex variabilis* var. *femorata* (Linnaeus, 1758); *Cimbex lutea* (Linnaeus, 1758); *Cimbex femorata* var. *silvarum* (Linnaeus, 1758); *Cimbex tristis* (Fabricius, 1779); *Tenthredo tristis* Fabricius, 1779 [not 1781]; *Cimbex silvarum* var. *tristis* (Fabricius, 1779); *Crabro annulatus* Geoffroy, 1785; *Crabro lunulatus* Geoffroy, 1785; *Cimbex silvarum* (Fabricius, 1793); *Tenthredo silvarum* Fabricius, 1793; *Cimbex femorata*

var. *silvarum* (Fabricius, 1793); *Cimbex flavomaculata* var. *silvarum* (Fabricius, 1793); *Cimbex sylvarum* (Fabricius, 1793); *Tenthredo sylvarum* Fabricius, 1793; *Cimbex femorata* var. *silvarum* (Fabricius, 1793); *Cimbex variabilis* var. *silvarum* (Fabricius, 1793); *Cimbex europaea* Leach, 1817; *Cimbex varians* Leach, 1817; *Cimbex femorata* var. *varians* Leach, 1817; *Crabro femoratus* var. *varians* (Leach, 1817); *Cimbex flavomaculata* var. *varians* Leach, 1817; *Cimbex silvarum* var. *varians* Leach, 1817; *Cimbex variabilis* var. *femorata-russa* Klug, 1820; *Tenthredo russa* Klug, 1820; *Cimbex variabilis* Klug, 1820 [not 1829]; *Tenthredo (Cimbex) variabilis* (Klug, 1820); *Cimbex pallens* Lepeletier, 1823; *Cimbex pallens* Serville, 1823; *Cimbex schaefferi* Lepeletier, 1823; *Cimbex schaefferi* Serville, 1823; *Cimbex pallidus* Stephens, 1829; *Cimbex venusta* Perty, 1833; *Cimbex biguetina* Lepeletier, 1834; *Cimbex femorata* var. *biguetina* Lepeletier, 1834; *Cimbex pallida* Stephens, 1835; *Cimbex femorata* var. *pallida* Stephens, 1835; *Cimbex femorata-lutea* Ratzeburg, 1844; *Cimbex variabilis* var. *russa* Eversmann, 1847; *Cimbex betulae* Zaddach, 1863; *Cimbex betulae* var. *feminae flavo-maculata* Zaddach, 1863; *Cimbex betulae* var. *feminae lutescens* Zaddach, 1863; *Cimbex betulae* var. *flavomaculata* Zaddach, 1863; *Cimbex betulae* var. *flavomaculata* Zaddach, 1863; *Cimbex flavomaculata* var. *flavomaculata* Zaddach, 1863; *Cimbex betulae* var. *lutescens* Zaddach, 1863; *Cimbex femorata* var. *lutescens* Zaddach, 1863; *Cimbex flavomaculata* var. *lutescens* Zaddach, 1863; *Cimbex betulae* var. *nigra* Zaddach, 1863; *Cimbex betulae* var. *pulla* Zaddach, 1863; *Cimbex flavomaculata* var. *pulla* Zaddach, 1863; *Cimbex sibirica* W.F. Kirby, 1882; *Cimbex fagi* Konow, 1897; *Cimbex taukushi* Marlatt, 1898; *Cimbex tonnaichana* Matsumura, 1911; *Cimbex tonnaichana* Matsumura, 1911; *Cimbex femorata* var. *abdominalis* Enslin, 1917; *Cimbex femorata* var. *unicolor* Enslin, 1917; *Cimbex femorata* var. *ornata* Uchida, 1927 [not 1928]; *Cimbex quadrimaculata* var. *sachalinensis* Uchida, 1927 [not 1928]; *Cimbex quadrimaculatus* var. *sachalinensis* Uchida, 1927; *Cimbex uchidai* (Takeuchi, 1931); *Crabro uchidai* Takeuchi, 1931; *Cimbex femorata* var. *uchidai* (Takeuchi, 1931); *Cimbex femorata uchidai* (Takeuchi, 1931); *Cimbex femorata* var. *varians* Takeuchi, 1931; *Cimbex femorata* forma *apicenotata* Kapuscinski, 1963; *Cimbex femorata* forma *bazylyuki* Kapuscinski, 1963; *Cimbex femorata* forma *coeruleomicans* Kapuscinski, 1963; *Cimbex femorata* forma *mongolica* Kapuscinski, 1963; *Cimbex femorata* forma *nowakowskii* Kapuscinski, 1963; *Cimbex femorata* forma *rubricollis* Kapuscinski, 1963; *Cimbex femorata* forma *rubromaculata* Kapuscinski, 1963; *Cimbex femorata* forma *silvicola* Kapuscinski, 1963; *Cimbex femorata* forma *subabdominalis* Kapuscinski, 1963; *Cimbex femorata* ab. *flavitegula* Stroganova, 1973; *Cimbex femorata* ab. *fuscescens* Stroganova, 1973; *Cimbex femorata* ab. *lucidus* Stroganova, 1973; *Cimbex femorata* ab. *nigroscutellum* Stroganova, 1973.

Distribution in Iran: Tehran (Abai, 2009).

General distribution: Austria, Belgium, Bulgaria, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy,

Japan, Korea (North and South Korea), Latvia, Luxembourg, Macedonia, Netherlands, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine (Taeger *et al.*, 2018).

Host plants: *Betula davurica*, *B. ermanii*, *B. pendula*, *B. pubescens* (Betulaceae) (Hara & Shinohara, 2000; Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 1998).

Subfamily Corynidae Benson, 1938

Genus *Corynis* Thunberg, 1789

***Corynis caucasica* (Mocsáry, 1886)**

Amasis caspica Konow, 1886; *Amasis caucasica* Mocsáry, 1886; *Corynus causicus* (Mocsáry, 1886).

Distribution in Iran: Guilan, Mazandaran (Khayrandish *et al.*, 2017), Iran (no locality cited) (Benson, 1968; Mucche, 1972; Çalmaşur, 2011).

General distribution: Bulgaria, former Yugoslavia (Taeger *et al.*, 2018), Iran, Southeast of Europe, Transcaucasia, Turkey (Benson 1968).

Host Plants: *Geranium* spp. (Geraniaceae) (Liston *et al.*, 2014).

***Corynis obscura* (Fabricius, 1775)**

Tenthredo obscura Linnaeus; *Amasis obscura* (Fabricius, 1775); *Cimbex obscura* (Fabricius, 1775); *Cimbex (Amasis) obscura* (Fabricius, 1775); *Corynis obscura* (Fabricius, 1775); *Corynis (Amasis) obscura* (Fabricius, 1775); *Tenthredo obscura* Fabricius, 1775; *Corynis obscura obscura* (Fabricius, 1775); *Amasis italica* (Lepeletier, 1823); *Cimbex italica* Lepeletier, 1823; *Corynis italica* (Lepeletier, 1823); *Amasis helvetica* Konow, 1886; *Amasis obscura* var. *helvetica* Konow, 1886; *Amasis obscura* var. *adusta* Zirngiebl, 1953; *Corynis obscura adusta* (Zirngiebl, 1953); *Amasis valkanovi* Vassilev, 1969 [not 1978]; *Corynis valkanovi* (Vassilev, 1969) [not 1978]; *Corynis valkanovi* Vassilev, 1969 [not 1978].

Distribution in Iran: Golestan (Astrabad = Gorgan) (Gussakovskij, 1947), Tehran (Khayrandish & Ebrahimi, 2018), Iran (no locality cited) (Gussakovskij, 1935; Mucche, 1973).

General distribution: Albania, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iran, Italy, Latvia, Macedonia, Norway, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine (Taeger *et al.*, 2018).

Host Plants: *Geranium silvaticum*, *G. sanguineum* (Geraniaceae) (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 1998).

***Corynis krueperi* (J.P.E.F. Stein, 1876)**

Corynis krueperi err.; *Corynis crueperi* (Stein, 1876); *Amasis krueperi* J.P.E.F. Stein,

1876; *Corynis krueperi* (J.P.E.F. Stein, 1876); *Amasis kruperi* Stein, 1876; *Amasis krüperi* Stein, 1876; *Amasis krüperi* J.P.E.F. Stein, 1876; *Amasis similis* Mocsáry, 1880; *Corynis similis* (Mocsáry, 1880).

Distribution in Iran: West Azarbaijan (Samin & Farzaneh, 2016).

General distribution: Crete, Cyprus, Greece, Israel, Jordan, Lebanon, Syria, Turkey (Çalmaşur, 2011).

Host Plants: *Papaver* sp. (Papaveraceae) (Liston, 1995).

Family Megalodontesidae Konow, 1897

Genus *Megalodontes* Latreille, 1802

***Megalodontes cephalotes* (Fabricius, 1781)**

Cephaleia cephalotes (Fabricius, 1781); *Diprion cephalotes* (Fabricius, 1781) *Tarpa cephalotes* (Fabricius, 1781); *Tenthredo cephalotes* Fabricius, 1781; *Tenthredo* (*Megalodontes*) *cephalotes* Fabricius, 1781; *Tenthredo* (*Tarpa*) *cephalotes* Fabricius, 1781; *Megalodontes klugi* (Leach, 1817); *Tarpa klugi* Leach, 1817; *Megalodontes klugii* (Leach, 1817); *Tarpa klugii* Leach, 1817; *Megalodontes spissicornis* (Klug, 1824); *Megalodontes* (*Megalodontes*) *spissicornis* (Klug, 1824); *Tarpa spissicornis* Klug, 1824; *Tarpa fuscipennis* Herrich-Schäffer, 1840; *Megalodontes klugi* Cameron, 1890.

Material examined: Kordestan province, Baneh (Kani-Chulkeh), 1♀, 5.VIII.2011. New record for Iran.

General distribution: Algeria, Andorra, Austria, Bosnia Herzegovina, Belgium, Bulgaria, Croatia, Czech Republic, Europe, France, Germany, Hungary, Italy, Latvia, Liechtenstein, Macedonia, Montenegro, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, former Yugoslavia (Taeger *et al.*, 2018).

Host plants: Larva hosts *Laserpitium latifolium*, *L. siler*, *Peucedanum cervaria*, *P. alsaticum* and *Seseli libanotis* (Apiaceae); young larvae feed gregariously (Liston & Späth 2011; Taeger, 2012).

***Megalodontes escalerae* Konow, 1899**

Megalodontes (*Rhipidioceros*) *escalerae* Konow, 1899.

Distribution in Iran: West Azarbaijan (Taeger *et al.*, 2018).

General distribution: Iran, Lebanon, Syria, Turkey (Taeger *et al.*, 2018).

Host plants: Unknown.

***Megalodontes eversmanni* (Freymuth, 1870)**

Tarpa eversmanni Freymuth, 1870; *Megalodontes* (*Rhipidioceros*) *loewi* (J.P.E.F. Stein, 1876); *Tarpa loewi* J.P.E.F. Stein, 1876; *Megalodontes loewii* (J.P.E.F. Stein, 1876);

Tarpa loewii J.P.E.F. Stein, 1876; *Megalodontes loewei* (J.P.E.F. Stein, 1876); *Tarpa loewei* J.P.E.F. Stein, 1876; *Megalodontes loewei* (Stein, 1876); *Tarpa loewei* J.P.E.F. Stein, 1876; *Tarpa multicincta* Mocsáry, 1891; *Tarpa (Megalodontes) multicincta* Mocsáry, 1891; *Megalodontes multicinctus* (Mocsáry, 1891); *Megalodontes (Rhipidioceros) multicinctus* (Mocsáry, 1891).

Distribution in Iran: Mazandaran, Qazvin (Khayrandish *et al.*, 2017), Iran (no locality cited) (Taeger, 2002).

General distribution: Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Iran, Russia, Turkey, Ukraine (Taeger, 2002; Taeger *et al.*, 2018).

Host plants: Unknown.

***Megalodontes flavicornis* (Klug, 1824)**

Tarpa flavicornis Klug, 1824.

Distribution in Iran: East Azarbaijan (Gussakovskij, 1935; Ushinskij, 1936), Guilan (Khayrandish *et al.*, 2017), Northern Iran (Benson, 1968; Taeger, 2002), Iran (no locality cited) (Taeger *et al.*, 2018).

General distribution: Armenia, Austria, Azerbaijan, Bulgaria, Czech Republic, Georgia, Germany, Hungary, Iran, Italy, Russia, Slovakia, Turkey, Turkmenistan, Ukraine (Taeger, 2002; Taeger *et al.*, 2018).

Host plants: Unknown.

***Megalodontes guichardi* Springate, Burckhardt & Springate, 2011**

Megalodontes escalera Konow, 1899.

Distribution in Iran: Guilan (Khayrandish *et al.*, 2017).

General distribution: North Africa and Middle East (Springate *et al.*, 2011); Iraq, Israel, Syria and Turkey (Taeger *et al.*, 2018).

Host plants: Unknown.

***Megalodontes olivieri* (Brulle, 1846)**

Tarpa olivieri Brulle, 1846.

Distribution in Iran: Guilan (Ebrahimi, 1995; Modarres Awal, 1997, 2012).

General distribution: Armenia, Egypt, Iran, Iraq, Israel, Morocco, Saudi Arabia (Taeger *et al.*, 2018).

Host plant: *Haplophyllum* sp., *Ruta* sp. (Rutaceae) (Modarres Awal, 1997, 2012).

***Megalodontes phaenicius* (Lepeletier, 1823)**

Megalodontes phaenicius err.; *Tarpa phaenicia* Lepeletier, 1823; *Megalodontes phaenicius* (Lepeletier, 1823); *Megalodontes phoeniceus* (Lepeletier, 1823); *Tarpa phaenicia* Lepeletier, 1823; *Megalodontes phaenicius* (Lepeletier, 1823);

Megalodontes (Rhipidioceros) phoenicius (Lepeletier, 1823); *Tarpa caucasica* Andr, 1881; *Megalodontes causicus* (Andr, 1881); *Megalodontes imperialis* Konow, 1897; *Megalodontes (Rhipidioceros) imperialis* Konow, 1897; *Megalodontes kohli* Konow, 1897; *Megalodontes (Rhipidioceros) kohli* Konow, 1897.

Distribution in Iran: Sistan & Baluchestan (Zirngiebl, 1956), Iran (no locality cited) (Taeger, 2002; Schedl, 2009).

General distribution: Azerbaijan, Bulgaria, Egypt, Greece, Iran, Moldova, Turkey, Ukraine, former Yugoslavia (Taeger, 2002; Taeger *et al.*, 2018).

Host plants: Larva on *Haplophyllum thesioides* (Rutaceae) (Taeger, 2002).

***Megalodontes xanthosomus* Zhelochovtsev, 1927**

Megalodontes curticornis Dovnar-Zapolskij, 1930; *Megalodontes (Rhipidioceros) curticornis* Dovnar-Zapolskij, 1930.

Distribution in Iran: Iran (no locality cited) (Gussakovskij, 1935; Ushinskij, 1936).

General distribution: Afghanistan, Kazakhstan, Turkmenistan, Uzbekistan (Taeger *et al.*, 2018).

Host plants: Unknown.

Family Orussidae Newman, 1834

Subfamily Orussinae Newman, 1834

Genus *Orussus* Latreille, 1796

***Orussus abietinus* (Scopoli, 1763)**

Sphex abietina Scopoli, 1763; *Oryssus abietinus* (Scopoli, 1763); *Sphex abietinus* Scopoli, 1763; *Tenthredo degener* Christ, 1791; *Oryssus vespertilio* (Fabricius, 1793); *Sirex vespertilio* Fabricius, 1793; *Oryssus coronatus* Fabricius, 1798; *Orussus coronatus* Fabricius, 1798; *Oryssus coronatus* Fabricius, 1798; *Sirex (Oryssus) coronatus* (Fabricius, 1798); *Oryssus albo-punctatus* Gimmerthal, 1836; *Oryssus albopunctatus* Gimmerthal, 1836; *Oryssus hyalinipennis* O.G. Costa, 1860; *Oryssus hyalinipennis* Costa, 1860; *Orussus abietinus* ab. *hyalinipennis* Costa, 1860.

Distribution in Iran: Guilan (Kraus, 1998), Iran (no locality cited) (Schedl, 2011).

General distribution: Albania, Algeria, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Turkey, Ukraine (Taeger *et al.*, 2018).

Host plants: Unknown.

Genus *Pseudoryssus* Guiglia, 1954

***Pseudoryssus henschii* (Mocsáry, 1910)**

Orussus henschi Mocsáry, 1910; *Orussus henschii* Mocsáry, 1910; *Oryssus henschii* Mocsáry, 1910; *Pseudoryssus emanuelis* Guiglia, 1956.

Distribution in Iran: Fars, Lorestan (Taeger *et al.*, 2018).

General distribution: Algeria, Bulgaria, Croatia, Cyprus, Germany, Greece, Iran, Iraq, Italy, Morocco, Russia, Switzerland, Turkey, Turkmenistan (Taeger *et al.*, 2018).

Host plants: Unknown.

Family Pamphiliidae Cameron, 1890

Subfamily Cephalciinae Benson, 1952

Genus *Acantholyda* Costa, 1894

***Acantholyda erythrocephala* (Linnaeus, 1758)**

Cephaleia erythrocephala (Linnaeus, 1758); *Lyda erythrocephala* (Linnaeus, 1758); *Lyda (Cephaleia) erythrocephala* (Linnaeus, 1758); *Lyda (Lyda) erythrocephala* (Linnaeus, 1758); *Tenthredo erythrocephala* Linnaeus, 1758; *Tenthredo (Cephaleia) erythrocephala* Linnaeus, 1758; *Tenthredo (Lyda) erythrocephala* Linnaeus, 1758; *Pamphilius erythrocephalus* (Linnaeus, 1758); *Pamphilus erythrocephalus* Linnaeus, 1758; *Pamphilius lucidus* Rohwer, 1910; *Acantholyda erythrocephala* var. *vittata* Enslin, 1918; *Acantholyda grangeoni* Riou, 1999.

Distribution in Iran: East Azerbaijan (Sakenin *et al.*, 2008), Razavi Khorasan (Samin *et al.*, 2011).

General distribution: Austria, Belarus, Belgium, Bulgaria, Canada, China, Croatia, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Italy, Japan, Korea (North and South), Latvia, Lithuania, Luxembourg, Moldova, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United States of America (Taeger *et al.*, 2018).

Comments: *Acantholyda erythrocephala* was reported as the prey of *Cyrtopogon kushka* Lehr, 1998 (Diptera: Asilidae) by Samin *et al.* (2011) and prey of *Erax tenuicornis* (Loew, 1848) (Asilidae) by Sakenin *et al.* (2008).

Subfamily Pamphiliinae Cameron, 1890

Genus *Kelidoptera* Konow, 1897

***Kelidoptera maculipennis* (J.P.E.F. Stein, 1876)**

Kelidoptera maculipennis (J.P.E.F. Stein, 1876); *Lyda maculipennis* J.P.E.F. Stein, 1876; *Pamphilius maculipennis* (J.P.E.F. Stein, 1876).

Distribution in Iran: Guilan (Shinohara, 2002).

General distribution: Israel, Syria, Turkey (Taeger *et al.*, 2018).

Host plants: Unknown.

Genus *Onycholyda* Takeuchi, 1938

***Onycholyda trigaria* (Konow, 1897)**

Pamphilius trigarius Konow, 1897; *Pamphilius (Bactroceros) trigarius* Konow, 1897.

Distribution in Iran: Alborz, Guilan; Lorestan (Shinohara, 1997; 2002; Khayrandish *et al.*, 2017), Iran (no locality cited) (Blank *et al.*, 1998).

General distribution: Armenia, Azerbaijan, Iran, Russia (Taeger *et al.*, 2018).

Host plants: Unknown.

Genus *Pamphilius* Latreille, 1802

***Pamphilius balteatus* (Fallen, 1808)**

Lyda singulata Fabricius; *Pamphilius (Anoplolyda) balteatus* (Fallen, 1808); *Pamphilius (Bactroceros) balteatus* (Fallen, 1808); *Lyda cingulata* (Latreille, 1812); *Pamphilius cingulatus* Latreille, 1812; *Pamphilus cingulatus* Latreille, 1812; *Lyda suffusa* Hartig, 1837; *Tenthredo (Lyda) suffusa* (Hartig, 1837); *Pamphilius hortorum* Costa, 1894.

Distribution in Iran: Fars (Samin *et al.*, 2011).

General distribution: Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Iran, Ireland, Italy, Japan, Korea (North + South Korea), Netherlands, Norway, Poland, Romania, Russia, Slovakia, Sweden, Switzerland (Taeger *et al.*, 2018).

Comments: *Pamphilius balteatus* was reported as the prey of *Erax tenuicornis* (Loew, 1848) (Diptera: Asilidae) by Samin *et al.* (2011).

***Pamphilius betulae* (Linnaeus, 1758)**

Cephaleia betulae (Linnaeus, 1758); *Lyda betulae* (Linnaeus, 1758); *Pamphilius (Bactroceros) betulae* (Linnaeus, 1758); *Pamphilus betulae* (Linnaeus, 1758); *Tenthredo betulae* Linnaeus, 1758; *Tenthredo (Cephaleia) betulae* Linnaeus, 1758; *Tenthredo (Lyda) betulae* Linnaeus, 1758; *Tenthredo fulva* Retzius, 1783; *Lyda aurita* Klug, 1808; *Pamphilus auritus* (Klug, 1808).

Material examined: West Azarbaijan province, Chaldoran (Aqdash), 2♀♀, on *Betula pendula* (Betulaceae), 26.viii.2012. New record for Iran.

General distribution: Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Italy, Latvia, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine (Taeger *et al.*, 2018).

Host plants: The two adults were collected from *Betula pendula* (Betulaceae); so we

don't state strongly on host of this species, otherwise much more studies.

***Pamphilius pallipes* (Zetterstedt, 1838)**

Lyda flavipes Zetterstedt, 1838; *Pamphilius pallidipes* (Zetterstedt, 1838); *Lyda pallipes* Zetterstedt, 1838; *Pamphilius (Anoplolyda) pallipes* (Zetterstedt, 1838); *Pamphilius (Bactroceros) pallipes* (Zetterstedt, 1838); *Lyda variegata* Zaddach, 1866 [not 1865]; *Pamphilius pallidipes* Dalla Torre, 1894.

Distribution in Iran: Iran (no locality cited) (Shinohara, 2005).

General distribution: Austria, Belgium, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Netherlands, Norway, Russia, Slovakia, Sweden, Switzerland (Taeger *et al.*, 2018).

Host plants: Larvae feed on *Alnus viridis* De Candolle; *A. maximowiczii* Callier (Betulaceae); *Betula pendula* Roth and *B. pubescens* Ehrhart (Betulaceae) (Taeger & Blank, 1998).

***Pamphilius sylvaticus* (Linnaeus, 1758)**

Lyda silvatica (Linnaeus, 1758); *Tenthredo silvatica* Linnaeus, 1758; *Pamphilius silvaticus* (Linnaeus, 1758); *Pamphilius (Pamphilius) silvaticus* (Linnaeus, 1758); *Cephaleia sylvatica* (Linnaeus, 1758); *Lyda sylvatica* (Linnaeus, 1758); *Tenthredo sylvatica* Linnaeus, 1758; *Tenthredo (Cephaleia) sylvatica* Linnaeus, 1758; *Tenthredo (Lyda) sylvatica* Linnaeus, 1758; *Pamphilius sylvaticus* (Linnaeus, 1758); *Psen sylvaticus* (Linnaeus, 1758); *Tenthredo fulvipes* Retzius, 1783; *Cephalcia nemorum* Panzer, 1803; *Cephaleia nemorum* Panzer, 1803; *Pamphilius silvaticus* var. *bimaculatus* Enslin, 1917; *Pamphilius sylvaticus* var. *bimaculatus* Enslin, 1917.

Material examined: Lorestan province, Kuhdasht (Rumeshkan), 1♀, 1♂, 22.vii.2009. New record for Iran.

General distribution: All Europe, Caucasus, Turkey, Ural (Bulgaria, Croatia, Greece, Hungary, Macedonia, Romania, Slovenia, Turkey) (Shinohara & Blank, 2003).

Host plants: Larvae of the component species are solitary or gregarious leaf-rollers or web-spinners on Rosaceae, Betulaceae or Cornaceae (Shinohara & Kojima, 2011).

Family Siricidae Billberg, 1820

Subfamily Siricinae (Billberg, 1820)

Genus *Urocerus* Geoffroy, 1785

***Urocerus sah* (Mocsáry, 1881)**

Sirex sah Mocsáry, 1881; *Urocerus augur sah* (Mocsáry, 1881); *Sirex shach* Mocsáry, 1881.

Distribution in Iran: Northern Iran (Gussakovskij, 1935; Benson, 1943, 1968; Farahbakhsh, 1961; Behdad, 1988; Modarres Awal, 1997, 2012 as *Sirex sah*), Iran (no locality cited) (Mocsáry, 1881; Khayrandish & Talebi, 2015).

General distribution: Afghanistan, Iran, Russia, Spain, Turkey, Ukraine, United States of America, Uzbekistan (Taeger *et al.*, 2018).

Host plants: Larvae feed on *Populus* sp. (Salicaceae) and probably on *Ulmus* sp. (Ulmaceae) (Farahbakhsh, 1961; Modarres Awal, 1997, 2012).

Subfamily Tremicinae (Ashmead, 1898)

Genus *Tremex* Jurine, 1807

***Tremex fuscicornis* (Fabricius, 1787)**

Xyloecematium fuscicorne (Fabricius, 1787); *Sirex fuscicornis* Fabricius, 1787; *Sirex (Tremex) fuscicornis* Fabricius, 1787; *Sirex (Xyloterus) fuscicornis* Fabricius, 1787; *Urocerus fuscicornis* (Fabricius, 1787); *Xyloecematium fuscicornis* (Fabricius, 1787); *Xyloterus fuscicornis* (Fabricius, 1787); *Sirex fusciformis* Fabricius, 1787; *Tremex juxicernis* Fabricius, 1787; *Sirex struthiocamelus* Villers, 1789; *Sirex struthiocamelus* Villers, 1789; *Sirex camelogigas* Christ, 1791; *Sirex fuscicornis* Turton, 1802; *Tremex simulacrum* Semenov, 1921.

Distribution in Iran: Alborz (Shamohammadi *et al.*, 2008; Modarres Awal, 2012), Golestan, Guilan (Khayrandish & Ebrahimi, 2018), Razavi Khorasan (Khayrandish *et al.*, 2017).

General distribution: Austria, Bulgaria, Chile, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Japan, Korea (North and South Korea), Latvia, Moldova, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Ukraine (Taeger *et al.*, 2018).

Host plants: Larvae are polyphagous feeding on *Acer* sp. (Aceraceae), *Salix* sp. (Salicaceae), *Picea* sp. (Pinaceae), *Ulmus* sp. (Ulmaceae), *Robinia* sp. (Fabaceae) and *Juglans regia* Linnaeus (Juglandaceae) (Shahmohammadi *et al.* 2008), *Prunus x yedoensis* Matsumura (Rosaceae), *Ulmus propinqua* Koidzumi and *Zelkova serrata* (Thunberg) (Ulmaceae), *Acer negundo* Linnaeus, *Alnus japonica* (Thunberg), *Betula* sp. and *Carpinus betulus* Linnaeus (Betulaceae), *Celtis sinensis* Persoon (Cannabaceae), *Quercus* sp. and *Fagus sylvatica* Linnaeus (Fagaceae), *Salix* sp. and *Populus tremula* Linnaeus (Salicaceae) (Taeger & Blank, 1998), *Populus* sp. (Shamohammadi *et al.*, 2008; Modarres Awal, 2012).

Family Xiphydriidae Leach, 1819

Subfamily Xiphydriinae (Ashmead, 1898)

Genus *Xiphydria* Latreille, 1802

***Xiphydria prolongata* (Geoffroy, 1785)**

Tenthredo prolongata Geoffroy, 1785; *Xyphydria prolongata* (Geoffroy, 1785); *Hybonotus dromedarius* (Fabricius, 1787); *Sirex dromedarius* Fabricius, 1787; *Sirex (Xiphidria) dromedarius* Fabricius, 1787; *Sphex dromedarius* (Fabricius, 1787); *Urocerus dromedarius* (Fabricius, 1787); *Xiphidria dromedarius* (Fabricius, 1787);

Xiphydria dromedarius (Fabricius, 1787); *Xyphidria dromedarius* (Fabricius, 1787); *Xiphydria fasciata* Lepeletier, 1823 [not 1825]; *Xyphidria fasciata* Lepeletier, 1823 [not 1825]; *Xyphydria camelus* Lepeletier & Serville, 1828; *Oryssus fasciatus* Desmarest, 1860.

Distribution in Iran: Guilan (Ebrahimi, 1995; Modarres Awal, 1997, 2012; Khayrandish & Ebrahimi, 2018).

General distribution: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Italy, Latvia, Luxembourg, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Sweden, Switzerland, Ukraine, United States of America, former Yugoslavia (Taeger *et al.*, 2018).

Host plants: *Populus* sp. (Salicaceae), *Salix caprea* (Salicaceae), *Ulmus* sp. (Ulmaceae) (Ebrahimi, 1995; Taeger & Blank, 1998; Modarres Awal, 1997, 2012).

***Xiphydria scutellata* Konow, 1897**

Xiphydria scutellata Konow, 1897; *Xyphydria scutellata* Konow, 1897.

Distribution in Iran: Northern Iran (Konow, 1897, 1898; Gussakovskij, 1935; Ushinskij, 1936; Maa, 1949; Taeger *et al.*, 2018).

General distribution: Azerbaijan, Iran (Taeger *et al.*, 2018).

Host plants: Unknown.

DISCUSSION

This checklist and also three others, Tenthredinidae (Khayrandish *et al.*, 2017), Cephidae (Budak *et al.*, 2018) and Argidae (Ghahari *et al.*, 2019) indicate that the fauna of Iranian Symphyta with 194 known species is diverse (Fig. 1). Also, all the recorded species in this paper were collected from only 13 provinces among the 31 Iranian provinces (Fig. 2), which this means that most regions of Iran have not been sampled systematically. Guilan province (south of Caspian Sea) with 11 recorded species is more diverse than the others. Also, exact localities of two species, *Megalodontes xanthosomus* and *Pamphilius pallipes* are unknown which more faunistic surveys are necessary for proving of their occurrence in Iran. Since Iran is a large country with various geographical regions and climates, we expect more species of Symphyta to be discovered through faunistic surveys. Additionally, 16 family plants are the hosts of the Symphyta (Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae and Xiphydriidae) which of these, Betulaceae with five records is the preferred host (Fig. 3).

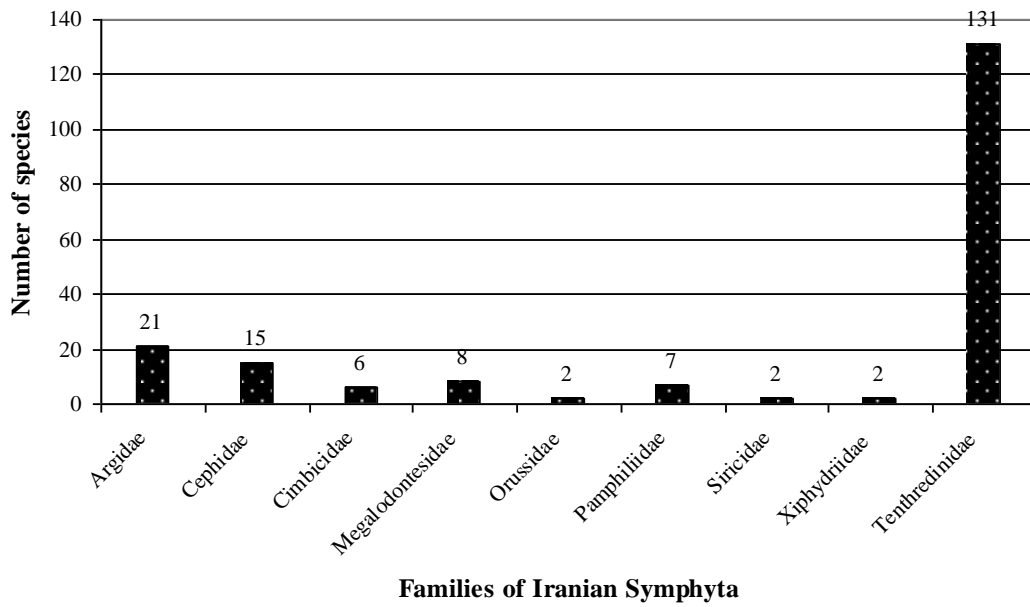


Figure 1.- Species diversity of Iranian Symphyta (Argidae: Ghahari *et al.* 2019; Cephidae: Budak *et al.* 2018; Tenthredinidae: Khayrandish *et al.* 2017; other families: present study). **Figura 1.-** Diversidad de especies de Symphyta iraní (Argidae: Ghahari *et al.* 2019; Cephidae: Budak *et al.* 2018; Tenthredinidae: Khayrandish *et al.* 2017; otras familias: presente estudio).

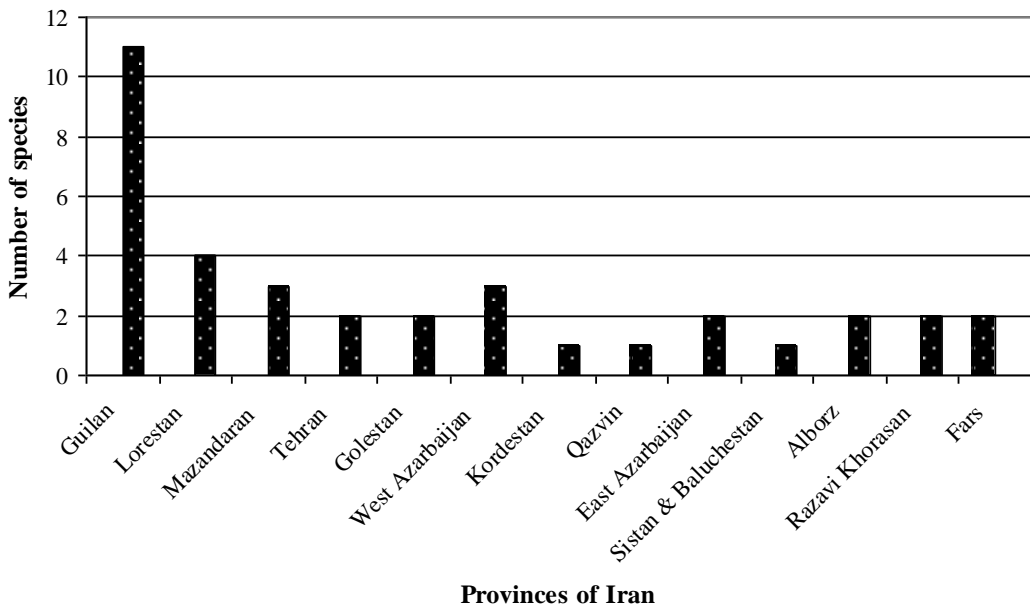


Figure 2.- Number of recorded species of Symphyta families (Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae and Xiphydriidae) by province. **Figura 2.-** Número de especies registradas de las familias Symphyta (Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae y Xiphydriidae) por provincia.

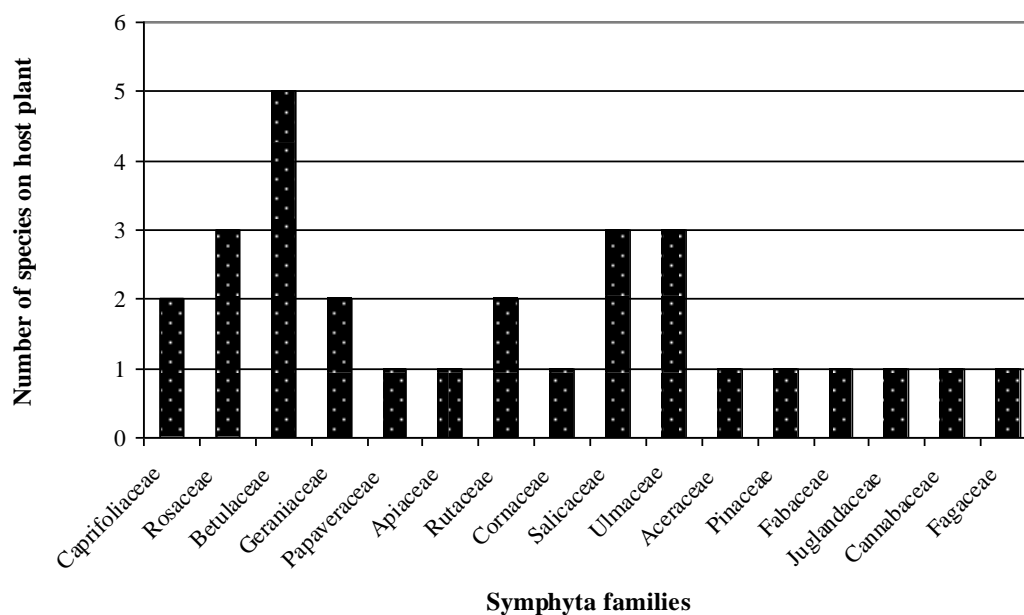


Figure 3.- Number of recorded species of Symphyta families (Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae and Xiphytriidae) on each host plant family. **Figura 3.-** Número de especies registradas de las familias Symphyta (Cimbicidae, Megalodontesidae, Orussidae, Pamphiliidae, Siricidae y Xiphytriidae) por provincia.

ACKNOWLEDGEMENTS

The authors are grateful to H. Chevin (17 rue des Marguerites, F - 78330 Fontenay-le-Fleury, France), K. Beneš (Kreuzmannova 14, CZ-31800 Plzeň, Czech Republic), D.R. Smith (National Museum of Natural History, USA) and G.F. Turrise (University of Catania, Italy) for contribution in progress of this project, and S.M. Blank (Senckenberg Deutsches Entomologisches Institut, Germany) for providing some papers. The research was supported by Islamic Azad University (Yadegar-e-Imam Khomeini (RAH) Shahre Rey Branch), and Cumhuriyet University.

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Receipt date: November 9, 2021

Accepted date: May 10, 2022

Published online: June 16, 2022

Fecha de recepción: 9/noviembre/2021

Fecha de aceptación: 10/mayo/2022

Publicado en línea: 16/junio/2022