



Investigation of the Chyphotidae and Xyedidae Families (Insecta: Hymenoptera)

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Open Access Research Journal of Life Sciences, 2023, 06(02), 011–024

Publication history: Received on 19 October 2023; revised on 02 December 2023; accepted on 05 December 2023

Article DOI: <https://doi.org/10.53022/oarjls.2023.6.2.0070>

Abstract

The Chyphotidae are a family of wasps similar to the Mutillidae, differing most visibly in the presence, in females, of a suture separating the pronotum from the mesonotum. These species are found primarily in arid regions of the southwestern United States and adjacent regions in Mexico. A record of a single species of Chyphotidae as ectoparasitoids of Solifugae (Arachnida) that pupated within the host's burrow is all that is currently known about their habits. The Typhoctinae are known to be diurnal, and the nocturnal Chyphotinae. The adults of Xyedidae are common flowers, pollen producers, and adjacent pine trees. In the Nearctic, these are the first saw wasps to appear in spring and are usually found flying around pine branches. The larvae feed on the shoots and pollen of these plants, although the larvae of a few species feed on deciduous trees rather than conifers. The objective is to survey the characteristics of the families Chyphotidae and Xyedidae (Insecta: Hymenoptera). Document analysis was performed as a data collection method to gather information on theoretical books, theses banks, university dissertations, scientific journals, documents, and digital platforms sites: The search criterion for articles was to prioritize articles that dealt with the topic. Document analysis was used as a data collection method to gather information on theoretical books, theses banks, university dissertations, scientific journals, documents, and websites.

Keywords: Ectoparasitoids Spider; Symphita; Wasp; Xyeloidea

Introduction

1 Family Chyphotidae

The Chyphotidae (= Bradynobaenidae) are a family of wasps similar to the Mutillidae, differing most visibly in the presence, in females, of a suture separating the pronotum from the mesonotum. These species are found primarily in arid regions of the southwestern United States and adjacent regions in Mexico (Figure 1) [1-2].

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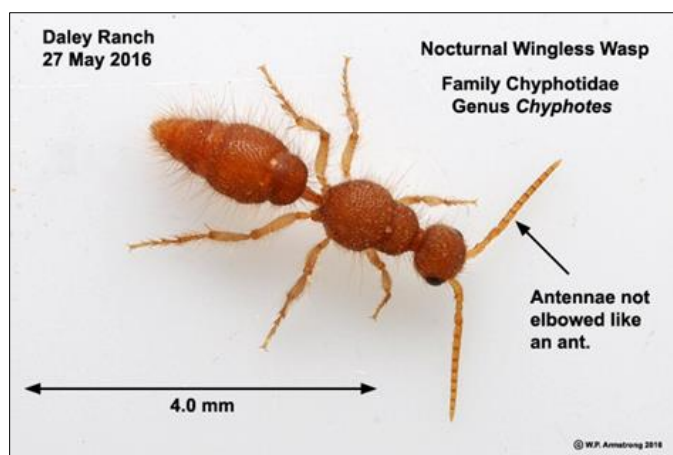


Source: https://upload.wikimedia.org/wikipedia/commons/thumb/d/db/Chyphotes_m.jpg/220px-Chyphotes_m.jpg

Figure 1 *Chyphotes* Blake, 1886 male, Arizona

1.1 Description

Marked sexual dimorphism; Insects of medium size, from 1 cm long, densely covered with hairs. The wasps are predominantly red-brown (male to black), similar to the German wasps of Mutillidae. There is a stridulatory organ. They have a sharp sexual dimorphism: females are wingless (antennae 12-segmented, ocelli are absent), males are winged (antennae 13-segmented, ocelli developed. The pronotum is large and freely articulated with the rest of the thorax. The fore and hind coxae are adjacent, while the middle coxae are separated by a protruding metasternite at the points of attachment from below the thorax meepimeron reduced. In Typhoctinae males are solid black and females are reddish black; daytime views. In Chyphotinae, females and males are monochromatic brownish; with night views. Biology is poorly understood; it is known that Typhoctinae is ectoparasitoids of arachnids from the phalanx order really (Figures 2-3) [3-10].



Source: <https://www.waynesword.net/AntDaleyRanch7.htm>

Figure 2 This minute wasp belongs to the genus *Chyphotes* Blake, 1886. It was collected at night under coast live oaks in a pitfall trap. It is apparently not that commonly seen by entomologists



Sources: Determined by Salvador Vitanza and <https://elp.tamu.edu/ipm/bugs/family-chyphotidae/hymenoptera-chyphotidae-chyphotes-chyphotid-wasps-male-p/>

Figure 3 *Chyphotes* Blake, 1886, Forewing

1.2 Biology

Possibly parasitoids of sun spiders (Solifugae). A record of a single species of Chyphotidae as an ectoparasitoid of Solifugae (Arachnida) that pupated within the host's burrow is all that is currently known to their habits, the Typhoctinae are known to be diurnal, and the nocturnal Chyphotinae [11-12].

1.3 Distribution Geographic

The Argentine fauna is represented by the genera *Eotilla* Schuster, 1949, *Prototilla* Schuster, 1949, and *Typhoctoides* Brothers, 1974, present in the Neotropical and Andean regions. The provinces where they were collected are Cordoba, Jujuy, La Rioja, Catamarca, Mendoza, Neuquen, and Salta. *Eotilla* has the largest distribution, found from Salta (Tacuil) to Neuquén (Covunco), at altitudes ranging between 1000-2900 m, while *Prototilla* is restricted to areas of lower altitude, between 200-700 m. *typhoctoides* It is located between 3000-4200 m, from Jujuy (La Quiaca) to Mendoza [13-15].

1.4 Systematic

- **Subfamily Chyphotinae, Genus *Chyphotes*** Blake, 1886. **Some Species:** *Chyphotes elevatus* Blake, 1886, *Chyphotes aenigmus* Mickel, 1967 (Canada, USA), *Chyphotes albipes* (Cresson, 1874) (Canada, USA), USA), *Chyphotes epedaphus* Buzicky, 1941 (USA), *Chyphotes evansi* Mickel, 1967 (USA) and *Chyphotes fergusonii* Mickel, 1967 (USA).
- **Subfamily Typhoctinae, Tribe Eotillini, Genus *Eotilla*** Schuster, 1949. **Some Species:** *Eotilla medanito* Torrens, Fidalgo, Roig-Alsina & Brothers, 2014 (Argentina), *Eotilla superba* Brothers, 1974 (Argentina). **Genus *Prototilla*** Schuster, 1949 (Argentina). *Prototilla intercalata* Torrens, Fidalgo, Roig-Alsina, Brothers, 2012 (Argentina), *Prototilla nigra* Torrens, Fidalgo, Roig-Alsina, Brothers, 2012 (Argentina). *Prototilla typhoctoides* (Martinez & Fritz, 1974) (Argentina).
- **Tribe Typhoctini, Genus *Typhoctes*** Ashmead, 1899. **Some Species:** *Typhoctes evansi* Quintero & Rodriguez, 1990 (Panama). *Typhoctes guatemalensis* Turner, 1909 (Guatemala). *Typhoctes peculiaris* (Cresson, **Genus *Typhoctoides*** Brothers, 1974. **Some Species:** *Typhoctoides aphelonyx* (Brothers, 1970) (Argentina, Chile). [15-19].

Objective

The objective is to survey the characteristics of the families Chyphotidae and Xyedidae (Insecta: Hymenoptera).

2 Methods

Document analysis was performed as a data collection method to gather information on theoretical books, theses banks, university dissertations, scientific journals, documents, and digital platforms sites: The search criterion for articles was to prioritize articles that dealt with the topic. Document analysis was used as a data collection method to gather information on theoretical books, theses banks, university dissertations, scientific journals, documents, and websites.

3 Selected Studies

3.1 Study 1

The vespoidea (Vespoidea) are a superfamily of insects of the order Hymenoptera; In ancient taxonomic schemes, this categorization varies, particularly in their recognition of the superfamily Scolioidea, now obsolete. The most well-known members of this group are avispa and ants.

3.1.1 Families of Vespoidea

Bradynobaenidae, Chyphotidae, Formicidae, Mutillidae, Myrmosidae, Pompilidae (now in Pompiloidea) – Pompilid wasps. Rhopalosomatidae, Sapygidae, Scoliidae - Scholid bird, Sierolomorphidae, Sierolomorphid, Thynnidae, Tiphidae, and Vespidae.

3.1.2 Taxonomy recently accepted

Families staying at Vespoidea

Rhopalosomatidae – Rhopalosomatid wasps, Vespidae, Families now in Formicoidea, Formicidae, Families now in Pompiloidea, Mutillidae, Myrmosidae, Pompilidae, Sapygidae, Families now in Scolioidea, Scoliidae, Families now in Tiphioidea, Bradynobaenidae, Sierolomorphidae, Typhidae, Families now in Thynnoidea, Chyphotidae, and Thynnidae.

Some more recent classifications place only the Vespidae and Rhopalosomatidae families within the Vespidae superfamily. Recent genetic studies indicate that the group needs a profound taxonomic revision. Rhopalosomatidae are sister clades within Vespoidea. At the same time, this group is Herman of the remaining avispa (and bees) Vespoidea and Apoidea. In addition, Apoidea is within Vespoidea, which suggests that Vespoidea (sensu lato) must be dismantled and form a series of smaller superfamilies: Formicoidea, Scolioidea, Tiphioidea, Thynnoidea, and Pompiloidea, in addition to a more narrowly defined Vespoidea. Finally, the Mutillidae, Tiphidae, and Bradynobaenidae families appear to be paraphyletic.

Another recent study confirms the need for a high-level review of relationships, even as relationships of smaller groups within Vespoidea van bien with the original studio patron. 2008, including the paraphyletic groups Bradynobaenidae and Tiphidae [20-27].

3.2 Study 2

Includes 5 genera (about 60 species). The composition and taxonomic position of the clade remains debatable. A group with a long and complicated taxonomic history, whose representatives were previously included in various groups: Mutillidae, Apterogynidae, Bradynobaenidae, Myrmosidae, and Tiphidae. The family was identified during the revision of the superfamily Vespoidea according to phylogenetic studies.

Vespoidea is recognized as paraphyletic and therefore some groups are separated into independent families and even superfamilies: Tiphioidea (Sierolomorphidae + Tiphidae) and separately Thynnoidea (Chyphotidae + Thynnidae). At the same time, the composition of some families has changed: Chyphotidae (Chyphotinae+Typhoctinae), Thynnidae (Anthoboscinae, Diamminae, Methochinae, Myzininae, Thynninae). Based on the first recognition of this group as monophyletic in a 1975 work, it was given its own subfamily status for the first time. For the first time as a family, Chyphotidae was designated in 1986, when it was included in the new superfamily Bradynobaenoidea (together with Typhoctidae, Apterogynidae, and Bradynobaenidae s.s.)

3.2.1 The family composition according to Torrén et al., 2014.

- **Subfamily Chyphotinae:** *Chyphot* Blake, 1886 (about 50 species)
- **Subfamily Typhoctinae:** *Eotilla* Schuster, 1949 (Chile and Argentina). *Prototilla* Schuster, 1949 (Argentina). *Typhoctes* Ashmead, 1899 (North and Central America). *Typhoctoides* Brothers, 1974 (Chile and Argentina) [28-35].

4 Family Xyelidae

The Xyelidae are a small family of Hymenoptera of the suborder Symphyta. Only 50 living species in 5 genera are known, but this family has many fossils. They are considered the oldest Hymenoptera fossils, from the Triassic 200 million years

ago. Most of the species are from the northern hemisphere, especially in the boreal regions, although there are also some Neotropical species. Most are associated with conifers, especially pine (Figure 4) [36-37].



Source: <https://idfg.idaho.gov/species/taxa/1522361>

Figure 4 Specimen Xilidae Family

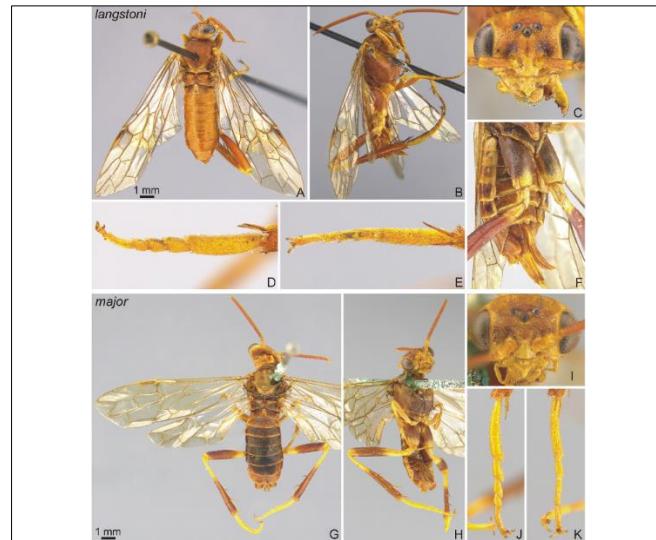
4.1 Description

Wasps are somewhat elongated, with lengths 2.0 to 12.0 mm, in most of the species from 2.0 to 5.0 mm; mostly brownish with yellow markings, and a few species with bright orange and bright orange and white patterns. Antenna with 9 to 25 segments, with a long and thickened first flagellomere, followed by a thin filament with 5 to 25 segments. pronotum, at most, with slight posterior sinuosity, not narrow on the midline (Figures 5-7) [37-38].



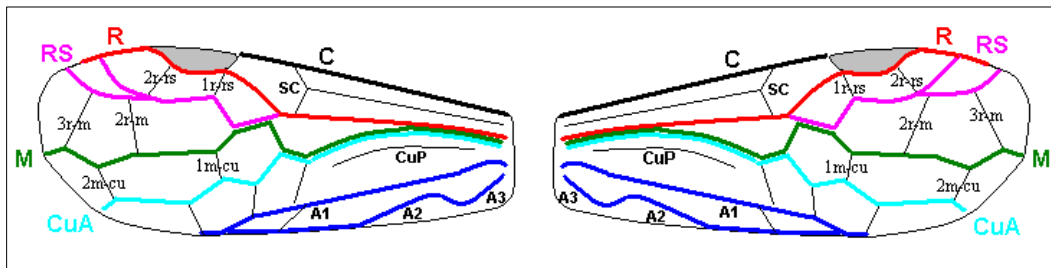
Source: <https://www.mindat.org/paleoimg.php?id=10312>

Figure 5 *Megaxyla fulvago* Blank sp, nov., Shinohara & Wei sp. nov. (A). Lateral habitus (♀). (B). Lateral metatarsus (♀). (C - D.) Lateral/ventral metatarsus (♂, holotype). (E - F). Dorsal/lateroventral habitus (♂, holotype). Frontal (G. Head) (♂)



Source: <https://www.mindat.org/paleoimg.php?id=461273>

Figure 6 *Megaxyela langstoni* Ross, 1936, ♀ (A – C = holotype, DEI-GISHym 30821, INHS; D – F = 30822, USNM). G – K. *Megaxyela major* (Cresson, 1880), ♂, paratype (30823, ANSP). A – B. ♀, holotype, habitus dorsal / lateroventral. C. ♀, holotype, head frontal. D – E. ♀, metatarsus, lateral / ventral. F. ♀, abdomen lateroventral. G – H. Habitus dorsal / lateroventral. I. Head frontal. J – K. Metatarsus lateral / ventral



Source: http://www.metafysica.nl/nature/insect/nomos_70.html

Figure 7 Diagram of left and right forewing of a primitive representative of the Suborder Symphyta. We have roughly indicated the seven main-vein systems: Costa (C, black, bold), Subcosta (SC, black, thin), Radius (R, red), Radial Sector (RS, violet), Media (M, green), Cubitus (CuA, light blue, CuP, black, thin), Analis (A1, dark blue, A2, dark blue, A3, dark blue). Further we have - also roughly - indicated where the chief cross-veins lie and how they are named. Cross-veins between R and RS (from proximal to distal): 1r-rs, 2r-rs. Cross-veins between RS and M (from proximal to distal): 2r-m (1r-m suppressed), 3r-m. Cross-veins between M and CuA (from proximal to distal): 1m-cu, 2m-cu

Mesonotum with shield and shield distinguishable, mesonotum not divided transversely; narrow mesoscutellar appendage. middle and hind tibia with preapical spines; anterior tibia with two apical spines. Female's ovipositor covering like a long sword and is thin. Genitalia of male protandrous type in *Xyela* Dalman, 1819 and *Pleroneura* Konow, 1897, organic type (not rotated) in *Macroxyela* Kirby, 1882, *Megaxyela* Ashmead, 1898, and *Xyelecia* Ross, 1932 [39-41].

4.2 Biology

The adults of Xyedidae commonly meet in catkins or on other flowers, pollen producers, and adjacent pine trees. In the Nearctic, these are the first saw wasps to appear in spring and are found usually flying around pine branches. *Pleroneura*, and *Xyelecia* larvae are borers of shoots in *Abies*, Mill. (Pinaceae). The larvae feed on the shoots and pollen of these plants, although the larvae of a few species feed on deciduous trees rather than conifers (Figure 8).



Sources: Photograph by Nathan Schiff and <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/xyelidae>

Figure 8 A female Xyelidae sawfly guarding her brood of first instars

The Xyelidae are Holarctic, except *Macroxyela* which is present only in central and eastern North America. Only several unidentified specimens of genus *Xyela*, have been registered in Mexico, specifically from Durango although they are expected to be present in the Southern American Center.

The larvae of Xyelidae are superficially similar to the caterpillars of Lepidoptera. The larvae of species that feed inside plants are whitish, those of species that feed freely are whitish-green or yellow. *Megaxyela* larvae resemble bird droppings. The rounded head capsule has a larval eye on each side and short antennae composed of five articles. The thorax has short legs made up of three articles. Xyelidae larvae have prolegs in all abdominal segments. In free-feeding Xyelidae (*Macroxyela* and *Megaxyela*) the abdominal offspring are conspicuous [42-45]

The pupa of Xyelidae is of the decticious and exarate types, in which the antennae, legs, and mandibles are free and mobile. This stage represents the already developed pharate imago which is still enclosed by the pupal skin. At this stage, the wings are not expanded, and in females, the ovipositor and its sheath curve dorsally above the tip of the abdomen. The decticious pupae are capable of biting open the cocoon, digging to the surface of the ground, moving around on the surface, and drinking [45-50].

A pharate insect is one that has completed the metamorphosis from larva to adult but is still inside the pupa. Many insect species diapause during the pupal stage often to avoid unsuitable environmental conditions. Inside the pupa, the adult pharate is ready to emerge but waits until the right moment before hatching from the pupa.

Many species of Xyelidae facultatively diapause for several years. In *Xyela alpigena* (Strobl, 1895) and *Xyela obscura* (Strobl, 1895), diapause of at least two years is obligate. This strategy might have evolved to ensure well-developed cones are available for oviposition: the host plants *Pinus cembra* L. and *Pinus mugo* Turra (Panacea) produce cones very irregularly in the subalpine zone of the European Alps.

Although they feed upon often economically important tree species, Xyelidae are usually of only small significance as pest organisms. *Pleroneura piceae* Shinohara & Hara, 1995, damages the growth of Sakhalin spruce since the larvae destroy the young shoots. Larvae of *Megaxyela major* (Cresson, 1880), feed on the leaves of pecan and are regarded as a pest of pecan plantations in the USA.

Xyelidae larvae burrow into the soil and form an earthen cell, where they usually spin a cocoon and transform into a pupa. The imago emerges the following spring to mate. Subsequently, the female deposits the eggs next to the ovipositor. *Megaxyela gigantea* Mocsary, 1909, and most other *Megaxyela* species have remarkably long hind legs that are used to fold a newly grown leaf to provide shelter for its eggs, which are attached with glutinous material between the upper parts of the folded leaf [51-54].

4.3 Taxonomy

Subfamily: Xyelinae: Genus: Pleroneura: at least eight species in Eurasia and five in North America. **Species:** *Xyela Brébisson*, 1819, *Xyelatana* Benson, 1938), *Xyela (Pinicolites)* Meunier, 1920: *Xyela lata* Smith 1920 western North America, *Xyela (Xyela)* Brébisson, 1819: 29 species in Eurasia and 20 in North America, but many additional species have not yet been described.

Subfamily Macroxyelinae: Genus: *Macroxyela*: Species: *Macroxyela aenea* (Norton, 1872) und *Macroxyela ferruginea* (Say, 1824) in eastern and central North America, *Megaxyela* Ashmead, 1898: six species in eastern Eurasia, seven species in North America, *Xyelecia* Ross, 1932: two species, *Xyelecia japonica* Togashi, 1972 in Japan[and *Xyelecia* Antarctica in Western North America] [55-56].

5 Selected Manuscripts

5.1 Study 1

5.1.1 *Pleroneura dahlii* (Hartig, 1837)

A species of sawflies (Xyelidae) from the superfamily Xyeloidea. Relic of the Neogene fauna. Body size 5-7 mm. The main color is black or dark brown, not shiny, the last segments of the abdomen are brighter, light brown, or reddish. The head is broad, mobile, distinctly separated from the body. The head and thorax are strongly structured with small, frequent dots, which gives the coloration a haze.

5.1.2 Description

Antennae orange, their 3rd segment strongly elongated and fusiform. The legs are long, and rufous, with 3-4 preapical spurs on the tibiae. The wings are wide; their length exceeds the length of the abdomen with the ovipositor. The color of the wings is brown, and even darker numerous veins stand out, forming a large number of cells. The length of the ovipositor reaches half the length of the abdomen.

5.1.3 Spreading

The range of this transgalactic species is sharply disjunctive (insular). Single isolated finds of individuals of the species are known from app. and central Europe, sowing. Korea and sowing. Japan (about. Hokkaido). From the territory of Russia, isolated finds are known from the Krasnodar Territory (Caucasian Reserve) and the Amur Region. (Selemdzhinsky district).

5.1.4 Habitat

Typical habitats of the species in the European and Asian parts of the range are foothills and mountain fir and mixed (with fir) forests. The larvae develop in buds and young shoots of various species of firs (*Abies*). Imago flies from May to July on the branches of fir crowns. The biology of the species has not been studied in detail.

5.1.5 Population

The species has a very low abundance in isolated populations. Indirect data testify to its steady reduction. The main limiting factor is the feeling of mountain fir forests.

5.1.6 Security

Protected in the Caucasian Reserve. It is necessary to limit the felling of mountain fir forests in unprotected areas [57-59].

5.2 Study 2

5.2.1 *Pleroneura coniferarum* (Hartig, 1837).

- **Distribution:** Map of *P. coniferarum* in Ukraine.
- **Taxonomic affiliation:** Class — Insecta (Insecta), order — Hymenoptera (Hymenoptera), family — Xyelidae [.
- **Conservation status:** Endangered. The range of the species and its distribution in Ukraine: The range covers Western and Central Europe, Mon. Afika was Founded in Ukraine in the Carpathians.
- **Number and reasons for its change:** Unknown. The reasons for the change in numbers have not been established.
- **Features of biology and scientific significance:** Phytophage. Gives 1 generation per year. Larvae develop singly in young shoots and buds of fir.
- **Morphological features:** Wings are almost colorless. The abdomen of the female is black. Body length — 5–7 mm.

- **Population preservation regime and protection measures:** Thoroughly study the peculiarities of the biology of the species, find out the places where populations exist and take them under protection; limit the felling of fir forests.
- **Breeding and breeding in specially created conditions:** No information.
- **Economic and commercial significance:** No information [60-61].

5.3 Study 3

The fossil record of the family is extensive, comprising more than 120 species and including the oldest fossil Hymenoptera species dating back to the Triassic, between 245 and 208 million years ago. Xyelidae is to be regarded as living fossils since they represent one of the oldest lineages of insects and include still extant forms. The extant species occur in the Northern Hemisphere, especially in boreal regions of the Holarctic, though there are a few Oriental species.

Two genera and about 15 species occur in Europe. Considering additional fossil records from Australia, South Africa and Argentina, the extant species display a relict distribution. The species in the subfamily Xyelinae are associated with conifers (esp. *Pinus* and *Abies*), where the larvae feed on pollen or within buds. The larvae of the subfamily Macroxyelinae feed on the leaves of deciduous.

The family is characterized by the appendages of the head, which are remarkable in that the antennae and palpi are nearly leg-like in structure, with a long basal segment followed by a series of tiny segments, as in the tibia-tarsus [62].

5.4 Study 4

During entomological research carried out in the forests of *Pinus calabrica* Gordon & Glend (Pinaceae), Cesca et Peruzzi of Etna for the census of phytophagous and parasitoid Hymenoptera insects, a Xyelidae was found which is new for the Sicilian fauna. The object of this note is to provide the new chronological data with brief faunal-biogeographic annotations.

The chronological citations relating to this Xyelidae concern, in addition to the Alpine area of Austria, Switzerland, and Italy from where most of the reports come), the Pyrenean area, southern Spain, southern France, Germany central and southern Italy, the Czech Republic, Hungary, Slovenia, Croatia, and Great Britain. In Italy, the species was known only from a few northern regions (Trentino Alto-Adige and Friuli Venezia-Giulia), Abruzzo (L'Aquila) and Calabria (Sila).

The host of *Xyela curva* Benson, 1938 on Etna is almost certainly represented by *P. calabrica* Cesca et Peruzzi, although no direct observations have been made. This Pinacea belongs to the "cycle" of *Pinus nigra* Arnoud (Pinaceae), and is in any case already known as a host species of *X. curva* for the Sila territory, as documented for the first time. *Pinus calabrica*, in Italy, is present in Calabria (on the *Sila*) and in Sicily (only on Etna).

The number of species of phytophagous insects sensu lato and xylophagous associated with this Pinacea on *Etna* has considerably increased especially since the mid-twentieth century, following targeted research.

The considerable number of insect taxa linked to the pine forest communities of *Etna*, some of which are endemic, reflects the ecological complexity of the animal populations present and is also evident. In particular, different trophic categories are represented, such as microsporophyllophages, phyllophages, xylophages, sub-corticules, saproxylophages, xylomycetophages, etc. of great importance from an ecological forest point of view, due to their role in the degradation of organic substances and the building-maturation of the forest soil.

Targeted surveys on the population's entomological findings related to *P. calabrica* on Etna will certainly lead both to the acquisition of further interesting finds, including endemic ones, and also contribute to a more precise knowledge of the ecological and biogeographic aspects of these forest communities, aspects to be taken into due consideration for correct naturalistic management by the Park Authority of Etna and the Forestry Corps [63].

5.5 Study 6

5.5.1 Phylogeny of the "Symphyta"

The oldest known fossil "Symphyta" belong to the family Xyelidae. These insects present a set of archaic features that have apparently been lost in the rest of the Hymenoptera. For example, they present the most extensive and complete venation of the entire order and their thorax is also very primitive, similar to that of some neurosteroids, lacking post-spiracular sclerite which, however, is present in the rest of the Hymenoptera.

All the cladistic studies carried out support the initial hypothesis that the Xyelidae is the ancestral group from which the rest of the Hymenoptera derive. Said author postulated, on the other hand, a diphyletic origin of the order from the ancestor Xyelidae which, on the contrary, is not confirmed by further studies.

Almost all the studies also indicate the relatively basal position of the Tenthredinoidea, while they agree on the difficulty of resolving the Megalodontoidea and Cephoidea clades plus the set of siricoid + orussoid + apocrite lines, which appear as unresolved polytomies.

The remaining Hymenoptera, excluding the Xyeloidea and Tenthredinoidea, appear as a monophyletic group supported by the position and musculature of the labrum, the presence of a hypostomal bridge, and the absence of prolegs in the larvae, although the position of the Megalodontoidea is still uncertain. The two most convincingly holophyletic groups of symphytes are the Megalodontoidea and the Cephoidea while the Orussoidea is a highly autapomorphic taxon that may have arisen from the Siricoidea.

A common conclusion of the different hypotheses of phylogenetic relationships of the "Symphyta" is the recognition of the fact that they constitute an artificial, paraphyletic group since to be considered monophyletic it would also have to include the Hymenoptera Apocrita [64-65].

5.6 Study 7

He postulated the existence of two evolutionary lines in the "Symphyta", a Tenthredinoidea line, with exophytic trophic habits, that is, with a tendency to feed on the plant externally, morphologically characterized by larvae with stemmata (ocelli) positioned dorsally about the antennae and adults with short ovipositors, specialized in cutting the plant tissues in which they spawned.

A second lineage or evolutionary line would comprise the remaining "Symphyta" (The *Orthandria*) and the Apocrita, characterized by a posteroventral position, about the antennae, of the stemmata in the larva and by a tendency for it to live internally (endophytic habit). However, this Rasnitsyn hypothesis about two phyletic lines in the origin of the Hymenoptera is not supported by the results of later studies.

It has been speculated about what the type of feeding of the larvae in the primitive phyletic lines of lymphocytes would be, as to whether they ate externally or internally in the plants to which they were associated, but as has been noted, it is not easy to determine given that the basal lineages of Hymenoptera, especially the Xyelidae, currently present a great variety of lifestyles; some macrosielines feed externally on the leaves of deciduous trees while other xyelids feed internally on buds or shoots of spruce or fruiting cones of pine trees.

Furthermore, the type of external feeding in the current Xyelidae cannot be classified as ancestral since they feed on angiosperms whose fossil record only goes back to the lower Cretaceous while the first Xyelidae date back to the Triassic.

Many Tenthredinoidea feed externally, quite a few on angiosperms, and it could be speculated that their diversification occurred along with that of this group of plants. However, one family of tentredinoids, the Blasticotomidae, is a fern borer so the ancestral pattern of feeding in tentredinoids cannot be established with certainty [66-68].

6 Conclusion

A common conclusion of the different hypotheses of phylogenetic relationships of the "Symphyta" is the recognition of the fact that they constitute an artificial, paraphyletic group since to be considered monophyletic it would also have to include the Hymenoptera Apocrita. Vespoidea comprises ten families (Formicidae, Vespidae, Scoliidae, Pompilidae, Mutillidae, Sapygidae, Thiphidae, Bradynobaenidae, Sierolomorphidae and Rhopalosomatidae). The Bradynobaenidae are a family of wasps similar to the Mutillidae, differing most visibly in the presence, in females, of a suture separating the pronotum from the mesonotum. These species are often found in arid regions. Recent classifications (remove two of the five constituent genera, both from the New World, to a separate family Chyphotidae, thus restricting true bradynobaenids to the Old World. Vespoidea comprises ten families (Formicidae, Vespidae, Scoliidae, Pompilidae, Mutillidae, Sapygidae, Thiphidae, Bradynobaenidae, Sierolomorphidae and Rhopalosomatidae). The Bradynobaenidae are a family of wasps similar to the Mutillidae, differing most visibly in the presence, in females, of a suture separating the pronotum from the mesonotum. These species are often found in arid regions. Recent classifications (remove two of the five constituent genera, both from the New World, to a separate family Chyphotidae, thus restricting true bradynobaenids to the Old.

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