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# Wasp and bee expedition on the Alp Flix

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Wespen- und Bienenexkursion auf der Alp Flix

## Zusammenfassung

Auf der Suche nach einer neuen Blattwespenart (Bethylidae), welche zuvor in den Französischen Alpen entdeckt wurde, fand im August 2005 eine Expedition auf der Alp Flix statt. Mit Kescher und Handfängen wurden 217 Insekten gefangen, welche ungefähr 90 verschiedenen Arten zugeordnet werden konnten. 45 Arten waren auf der Alp Flix zuvor noch nicht nachgewiesen.

**Schlagworte:** Insekten, Habitate, Alp Flix, Graubünden

## Summary

In August 2005 an expedition was undertaken on Alp Flix to look for a new bethylid species that had been captured before in the French Alps. By net sweeping and hand captures, a total of 217 insects belonging to approx. 90 species were found. 45 species have not been recorded for the Alp Flix before.

#### 1. Introduction

Alp Flix and the facility of *Rhexoza flixella* came as a welcome chance to explore the Swiss Alps. After having compiled a checklist of Bethylidae wasps for Fauna Helvetica I became aware that extensive areas of Switzerland were obviously blank territory where this family was involved.

In 2003 the male of a mysterious new bethylid species had been captured in the French Alpes, so in August 2005 I went to Alp Flix with the intention to discover the unknown female of this species. As I could stay no longer than a week and didn't quite know what to expect at an altitude of 2000 meters. I went without strategy, just a taking sweeping net and a jar. My visit could therefore best be described as an expedition, more so than as scientific research.

Eventually I would return without a single bethylid, but my efforts to capture these carefully hidden wasps exposed many other insects. Just by dragging grasses and shrubs with a sturdy net and catching specimens on sight I managed to find about 90 species of insects. Grasshoppers and dragonflies, which demand elaborate preparation to preserve the colours, appeared to be well studied in the area and I decided not to collect them. Butterflies were also left alone with the Swiss legal restrictions in mind.

### 2. Agriculture

The main vegetation of the Alp Flix highland plane (2000 m) appeared to have an agricultural character. Hayfields (*Polygono-trisetion*) dominate the central area and Alpine meadows (*Poio alpinae*) cover the adjacent mountain slopes. Hayfields can provide food for dozens of bees and wasps if flowering herbs are tolerated by the farmers, but by the time we arrived the hay was being harvested. Several other vegetation types however were available and proved to be equally interesting.

## 3. Alpine meadows

Survival of this half-cultivated vegetation type is said to depend on the herding of cows in a traditional way. The small mountain cows with their intelligent expression and big hooves keep these pastures from getting overgrown with less variable vegetation, probably Green Alder bushes. As farming at this altitude doesn't seem to be very profitable, most agricultural activities are heavily subsidized.

The floral richness of the Alpine meadows gave the impression that insects could be found in the same amounts and diversity. Perhaps in the preceding months this could have been the case, but during my stay most of the bright flowers were unattended by arthropod visitors. The worn wings of many coll-



Fig. 1: Typical landscape on the Alp Flix consisting of hayfield, meadow and heather.

ected wasps and the bees indicated that the high season had passed long before. The average life span of a bee or wasp does not exceed more than a several weeks, under exceptional conditions up to a few months. Especially bees often have a relationship with specific families of flowering plants, some even just a single species. Before the flowers of these plants are no longer available, the females must have collected enough pollen and nectar to raise their brood.

Not the flowers but the large boulders along the meadows were the favourite location of most wasps on the Alp Flix. In fact all cuckoo wasps (Chrysididae), all spider wasps (Pompilidae) and 80% of the digger wasps (Crabronidae = Sphecidae s.l.) and mason wasps (Vespidae: Eumenidae) were collected on big rocks in, or along the meadows. Mason wasps build nests of clay against stone surfaces which they fill with paralyzed larvae of moths or beetles. The recorded species of cuckoo wasps lay eggs in these nests. The spider wasps obviously were looking for spiders on the surface of the stones.

Ogcodes zonatus, one of the most intriguing flies on the Alp, must have had the same reason as the spider wasps to be on these boulders. Larvae of this species are known to live as parasites in spiders. It was the first time I ever saw these hump-backed flies with their black and white rings around the abdomen, apparently mimicking wasps. The family Acroceridae was never recorded from Alp Flix either.

Monkshood (*Aconitum*) can be frequently found along the banks of small streams that cross the meadows. Remarkably many black bumblebees with red tails visited the dark purple-blue flowers of these plants. Bumblebees are space-consuming animals in collections and take weeks to dry, but luckily I took several specimens home. It turned out that two exact look-alikes had been joining their meals on the monkshood flowers: the common *Bombus lapidarius* and the rare *Bombus wurfleini*. Their males are easy to identify by the unique shapes of their copulation forcipes.

## 4. Ungrazed parts of the tree line

Above the elevations where the climatic conditions become too harsh for spruce (*Picea*), Green Alder (*Alnus viridis*) still manages to grow. This shrublike tree in confined to the roughest and steepest slopes of the mountains. Herding becomes risky here and the herbs therefore remain untouched by cows. The open spots on the south sides of cliff formations



Fig. 2: Sedge community along a brook.

are rich on flowers as well as insects, even at this altitude. About 400 m SW of Salategnas, at the southern border of the Alp Flix territory, dozens of large Leaf beetles (Chrysomelidae) were everywhere in the vegetation. Very impressive were the metallic blue-violet-green coloured *Oreina speciosa* and the black, granulated *Galeruca tanaceti*. The mason bee *Osmia inermis* and the Small Heath Bumblebee *Bombus jonellus* visited tufts of hawkweed (*Hieraceum*) hanging from a wind-shielded and sun-warmed vertical cliff surface.

## 5. Marshy Sedge communities

The banks of the bright turquoise coloured lakes contain, like the brooks of the Alpine meadows, a considerable amount of clay. At the shallowest and least stirred parts of these banks I found some interesting marshy vegetations, consisting of mainly larger sedges (*Magnocaricion*). Distributed over different parts of Alp Flix calcareous fen meadows (*Caricion davallianae*) fill the shallow and wide sections of many brook beddings. The soil mainly consists of thick

layers of mosses which makes it unattractive for cows. The grazing or fertilization pressure therefore remains low in these fields, ensuring their untouched and acidulous character. Plants like Purple Moor-grass (*Molinia caerulea*), Cotton-grass (*Eriophorum*) and Grass of Parnassus (*Parnassia palustris*) mark this vulnerable ecosystem, which is endangered throughout Europe.

Extremely rare wingless wasps are known from acidulous marshes, like some Embolemidae, Dryinidae and Bocchinae, but finding them requires long term research with complex equipment. A few simple sweeping actions in some fen meadows (Rlancas, 400 m SW of Tigias, and Lai digl Mestgel, 950 m NE of Sur) and the banks of Lais Blos did however expose some other interesting insects, mostly plant hoppers and bugs (Hemiptera: Heteroptera and Cicadomorpha). Although the area had been thoroughly searched for bugs and jumping plant lice in the past, no records of the closely related plant hoppers appeared to be present in the available lists (GEO 9/2000 Beilage «GEO-Tag der Artenvielfalt» and database Plant Science Centre Zürich-Basel). No wonder that all seven plant hopper species could be listed as new for Alp Flix. With the acceptance of the single Delphacidae species collected in the *Calluna* vegetation of Son Roc (400 m. W of Tigias), all plant hoppers (Cercopidae and Cicadellidae) came from marshy Sedge vegetations. A similar distribution can be detected for the bugs: specimens came either from heathlands or marshes.

## 6. Acidophilus scrublands

A vegetation type very much related to fen-meadows are the dwarf shrub heathland communities (*Juniperion nanae*) that cover the rough, stony parts of the area. Both need acidulous soils and avoid nitrates. Often no sharp boundaries can be drawn between the two. The heathland patches on the Alp Flix showed a surprising similarity to the heathlands (*Calluno-Genistion pilosae*) of northwest Europe. Scotch Heather (*Calluna vulgaris*) dominates this vegetation, now and than accompanied by an Alpine dwarf subspecies of Juniper (*Juniperus communis* ssp. *alpina*). Bilberry (*Vaccinium myrtillus*) manages to flourish without the shade of trees that it needs in the Dutch lowland heaths that I am familiar with.

The heather vegetation seems to profit from it's overall dark colour, which enables it to absorb every bit of sunlight and render still some warmth in late summer. This is perhaps the reason that still many aculeate wasps and bees were active in August, when snow could be expected again. Bumblebees like *Bombus lucorum*, *Bombus pratorum* and *Bombus terrestris*, which were all present together at Plang Grond (600 m. SW of Tigias), are very common in the lowland heaths of the Atlantic temperate climate zone.

Yellow composites like hawkweed (*Hieraceum*) prefer the open, sandy spots of heathlands and are very much in favour by smaller bees. At Son Roc both the relatively common solitary bee *Lasioglossum albipes* and the rare *Dufourea alpina* were collected on composite flowers.

The environment of the Lais Blos lakes combines heather vegetation and open sand with impressive boulders and rocky peaks. The wide variety of flowers make the area irresistible for solitary bees. Species like Lasioglossum bavaricum, Lasioglossum fratellum, Halictus rubicundus, Hoplitis villosa and Panurginus montanus were all present here, obviously nesting in the soil near the big rocks.

Some sweeping on the heather-overgrown hills west of Lais Blos lakes resulted in the capture of the extremely rare ant *Myrmica lobulicornis*, but also of *Ectobius sylvestris*, one of the most common cockroa-

ches in the northwest of Europe. At Son Roc the small parasitic wasp *Brachygaster minuta* turned up, a well known ectoparasite of this species.

#### 7. Pine-forests

The pine-forests of Alp Flix consist mainly of Norway spruce (*Picea abies*), a tree that has quite little to offer for wasps and bees. Only ants seem to feel comfortable on the rather sterile needle-covered ground, and the large hills of wood ants were present in several pine-groves. Workers taken from different locations all appeared to be identical. The species resembled the wide spread *Formica lugubris*, but may actually be the rare Alpine species *Formica paralugubris*. Europe's foremost ant specialist Dr. Bernhard Seifert (Görlitz, Germany) identified the workers as belonging to this species complex but needed more material to be sure.

Sun-exposed open spaces in forests may still attract at least some aculeates, providing that food and nesting facilities are available. The large black, aphid hunting wasp *Pemphredon rugifer* for instance was taken on Kidney Vetch (*Anthyllis vulneraria* ssp. *alpestris*) along the road from Sur to Alp Flix. This species makes mines in dead wood to store paralyzed plant lice for the offspring.

#### 8. Collected material

The highest hills of The Netherlands reach no more than 300 meters and Dutch specialists rarely have to deal with Alpine species. Identification of the material collected at Alp Flix therefore took a while, but surprisingly many specimens could be matched with the right names. One German and Nine Dutch specialists performed the identifications on mostly unpreparated specimens, handed to them in paper envelopes with labels. Most of the specimens were left at their disposal afterwards.

Among the 217 collected specimens about 90 species could be distinguished, belonging to 9 different insect orders. No less than 45 species had not been recorded from Alp Flix before.

One of the most interesting results of this collecting expedition for me was to find that both specialized Alpine species and common European lowland species appear to live in mutual ecosystems at an elevation of 2000 m. Adaptation and flexibility of species are a field that requires special attention, certainly with the effects of global warming in mind.

idae, ae	* *	Arctophila bombiforme (Fallén 1810) Volucella bombylans (Linnaeus 1758) var. plumata Baccha spec. Eristalis spec. 1 Eristalis spec. 2 Eristalis spec. 3 Leucozona lucorum (Linnaeus 1758) Rhyngia spec. unidentified spec. 1 unidentified spec. 2  Tephritidae unidentified spec. 1	Tru, Sal1 Sal1 Rla1 LBl2 Sal1 Tig Sal3 Sal1 SRc Sal3
o Alp Flix, – Tag der	Hemiptera Cicadomorpha Cercopidae  * Neophilaenus exclamationis (Thunberg 1784) LdM, ssp. alpicola Rla1, SRc Cicadellidae  * Anacertagallia venosa (Fourcroy 1785) SRc		
Sall Sall Sall, Sal3 LdM, SRc Sal3	<ul> <li>* Deltocephalus pulicaris (Fallén 1806)</li> <li>* Ebarrius cognatus (Fieber 1869)</li> <li>* Psammotettix cephalotes (Herrich-Schäffer 1834)</li> <li>* Verdanus abdominalis (Fabricius 1803)</li> <li>Delphacidae</li> </ul>	SRc LBl4 LdM, Rla1 LdM, LBl4	
LdM, Rla1		Alydidae	SRc
LBI3	*	Ligyrocoris sylvestris (Linnaeus 1758)	LdM LdM, LBl4, Rla1, SRc
Sall Sall	*	Chlamydatus pulicarius (Fallén 1807) Cremnocephalus alpestris Wagner 1941	SRc LdM
Sal2			LBl4
SRc			SRc
LBl3	1	Psyllidae Aphalara longicaudata Wagner & Franz 1961SRc	
SRc			
SRc		Apidae	Sal3
SRc	*	Bombus jonellus (Kirby 1802)	Sal3 Sur1
	o Alp Flix, — Tag der  Sall Sall Sall, Sal3 LdM, SRc Sal3 LdM, Rla1  LBl3  Sall Sall Sall Sall Sall Sall Sall S	* * * * * * * * * * * * * * * * * * *	* Volucella bombylans (Linnaeus 1758) var. plumata  * Baccha spec. Eristalis spec. 1 Eristalis spec. 2  Eristalis spec. 2  Eristalis spec. 1 Leucozona lucorum (Linnaeus 1758) Rhyngia spec. unidentified spec. 1 unidentified spec. 2  Tephritidae unidentified spec. 1 unidentified spec. 2  Hemiptera Cicadomorpha Cercopidae  * Neophilaenus exclamationis (Thunberg 1784 ssp. alpicola  Cicadellidae  * Anacertagallia venosa (Fourcroy 1785) Deltocephalus pulicaris (Fallén 1806)  * Ebarrius cognatus (Fieber 1869)  * Psammotettix cephalotes (Herrich-Schäffer 1834)  * Verdanus abdominalis (Fabricius 1803)  Delphacidae  LdM, SRc * Dicranotropis divergens Kirschbaum 1868  Lygaeidae  * Ligyrocoris sylvestris (Linnaeus 1758)  Lygaeidae  * Ligyrocoris sylvestris (Linnaeus 1758)  Nithecus jacobaeae (Schilling 1829)  Miridae  * Chlamydatus pulicarius (Fallén 1807)  * Cremnocephalus alpestris Wagner 1941  Nabidae Nabis flavomarginatus Scholtz 1847  Sal2  Pentatomidae Dolycoris baccarum (Linnaeus 1758)  SRc  Sternorrhyncha Psyllidae  Aphalara longicaudata Wagner & Franz 196  SRc  Hymenoptera Apoidea Apis mellifera Linnaeus 1758  * Bombus jonellus (Kirby 1802)

*	(female uncertain)  Pompilidae  Agenioideus cinctellus (Spinola 1808)  Anoplius tenuicornis (Tournier 1889)  Vespidae  Ancistrocerus scoticus (Curtis 1826)	Sall Sall	Trichoptera Limnephilidae Drusus discolor (Rambur 1842)  Philopotamidae  * Philopotamus montanus (Donovan 1813)	Sal2
	Pompilidae Agenioideus cinctellus (Spinola 1808)		Limnephilidae	Sal2
*	(temale uncertain)			
	Manica rubida (Latreille 1802) Myrmica lobulicornis Nylander 1857	LBl1, Sal2 LBl3	Plecoptera unidentified spec.	Rlal
*	Formicidae Formica exsecta Nylander 1846 Formica lemani Bondroit 1917 Formica lugubris Zetterstedt 1838/ paralugubris Seifert 1999 Leptothorax acervorum (Fabricius 1793)	Tig Sall LBll, PGr2, Sall Sall, Sur2	Mecoptera Panorpidae Panorpa germanica Linnaeus 1758	Sal1
*	var. wesmaeli Trypoxylon medium De Beaumont 1945	Sall	Symphyta Tenthredinidae unidentified spec.	Sal1
* *	Crabronidae (Sphecidae s.l.)  Diodontus handlirschi Kohl 1888  Dryudella femoralis (Mocsáry 1877)  Pemphredon rugifer (Dahlbom 1844)	Sall Sall Sur2	Proctotrupoidea Proctotrupidae * unidentified spec.	LdM
	Chrysididae Chrysis ignita (Linnaeus 1758) Chrysis ruddii Shuckard 1836	Sall Sall	<b>Ichneumonoidea</b> several unidentified spec.	LdM, SRo Rla1, Sal
*	Bombus lucorum (Linnaeus 1761) Bombus mucidus Gerstaecker 1869 Bombus pratorum (Linnaeus 1761) Bombus terrestris (Linnaeus 1758) Bombus wurfleini Radoszkowski 1859 Dufourea alpina Morawitz 1865 Halictus rubicundus (Christ 1791) Hoplitis villosa (Schenck 1853) Hylaeus nivalis (Morawitz 1867) Lasioglossum albipes (Fabricius 1781) Lasioglossum bavaricum (Blüthgen 1930) Lasioglossum fratellum (Pérez 1903) Osmia inermis (Zetterstedt 1838) Osmia laevifrons (Morawitz 1872) Panurginus montanus Giraud 1861	PGr1, Rla2 Sal1, Tru PGr1, Sur1 PGr1 Sal1, Tru SRc LBl1 LBl2 Sal1 SRc LBl1, Sal1 LBl1 Sal3 Sal1 LBl3	Odynerus alpinus Von Schulthess 1897 Polistes biglumis (Linnaeus 1758) ssp. bimaculatus  * Stenodynerus laticinctus (Von Schulthess 1897)  * Vespula rufa (Linnaeus 1758)  Chalcidoidea unidentified spec.  Cynipoidea Cynipidae  * unidentified spec.  Evanioidea Evaniidae  * Brachigaster minuta (Olivier 1791)	Tig Sal1 Sal1 SRc SRc SRc

#### Abbreviations:

Abbreviations:							
LBl1	Lais Blos NW	Rocky peak at bank of lake					
LBl2	Lais Blos S	Road side near lake					
LBl3	Lais Blos SW	Rocky, heath-covered hill					
LBl4	Lais Blos W	Marshy bank of lake (Magnocarion)					
LdM	Lai digl Mestgel (950 m. NE Sur)	Fen meadow (Caricion davallianae)					
PGr1	Plang Grond (600 m. SW Tigias)	Small valley with Heather (Juniperion nanae)					
PGr2	Plang Grond (700 m. SW Tigias)	Pine forest (Picea abies)					
Rlal	Rlancas (400 m SW Tigias)	Fen meadow (Caricion davallianae)					
Rla2	Rlancas (500 m W Tigias)	Heath-covered top of sandy hill (Juniperion nanae)					
Sal1	Salategnas, 100 m W	Meadow in valley along brook (Poio alpinae)					
Sal2	Salategnas, 20 m E	Rocky bedding of brook					
Sal3	Salategnas, 400 m SW	Bushy mountain slope (Alnus viridis)					
Sal4	Salategnas, village	Wooden fence					
SRc	Son Roc (400 m W Tigias)	Sandy heathland plane (Juniperion nanae)					
Surl	Sur, 200 m E	Mountain slope meadow (Poio alpinae)					
Sur2	Sur, 200 m E	Road side in pine forest ( <i>Picea</i> )					
Tig	Tigias, 300 m S	Road side in hayfield (Polygono-trisetion)					
Tru	Truaschinga (500 m E Sur)	Mountain slope meadow (Poio alpinae)					