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RECORDS OF *CHRYSIDIDAE* (HYMENOPTERA) FROM WESTERN POLAND

Abstract. A list of 36 species of *Chrysididae* has been presented. Among them two species *Hedychrum femoratum* and *Chrysis splendidula* are recorded from Poland from the first time. Habitat preferences, dominance structure and feeding plants of investigated were given.

1. Introduction

The species composition and geographical distribution of *Chrysididae* in Poland are still little known. It should be emphasised that most of the so far data on that subject are contained in the publications on the turn of the past and present centuries. Therefore, the nowadays information on chrysidids occurring in Poland is partially of historical importance and requires up-dating. Moreover, chrysidids were comparatively seldom the subject of special studies and were collected rather occasionally at studies on other *Aculeata*. In consequence a significant part of Poland is insufficiently known in this respect and some areas are completely unexplored. There is a need of systematic up-to-date faunistic studies on *Chrysididae*. As a matter of fact it is a more general problem concerning the majority of animals and *Aculeata* in particular.

That goal was the guiding principle for the authors of the present paper which contains results of several year investigations on *Chrysididae* in the western part of the Wielkopolsko-Kujawska Lowland. Particular attention has been devoted to the region of Ziemia Lubuska, which is still faunistically little

known. A list of the so far known species from that area, as well a review of the source literature can be found in the Catalogue of the Polish fauna devoted to *Chrysididae* (Banaszak 1980).

2. Material and Studied Stations

The material used for this study consisted of 713 specimens collected chiefly by Adam Kochanowski in 1983-1987. Several dozens specimens were from the collection of dr. J. Karg gathered in the vicinity of Turew near Kościan, Leszno Voivodeship.

The entire material was collected in the following 20 stations:

Gorzów Voivodeship:

1. Rogi (7 km NW of Lubniewice). Farm buildings: an old wooden barn and the top of a brick house (brick joints with numerous holes and nests). Besides that, on the logging area with a young pine culture, the edge of which was covered with abundant herbaceous vegetation (*Umbelliferae*).
2. Wałdowice (20 km W of Skwierzyna). Roadsides alongside a spruce thicket with a large considerable participation of *Umbelliferae* and *Achillea millefolium*.
3. Skwierzyna - sandy slopes at the road.
4. Lubniewice - gravel pit.
5. Glisno (10km NE of Sulęcín). On the stem of a dead sycamore in the park adjacent to the palace; on a wooden barn and on the brick nogged timber wall with numerous *Chrysis*. Deep in the forest on a sandy place, where *Hedychrum* and *Hedychridium* were captured especially numerously, on *Umbelliferae*, *Achillea millefolium* and *Helichrysum arenarium*.

Piła Voivodeship:

6. Chodzież - a sandy slope near the Miejskie Lake on *Jasione montana*, *Scabiosa* sp. and *Armeria elongata*. Also on the wooden and clay farm buildings (brick nogged timber wall). Canyon slope, mainly with *Armeria* and *Umbelliferae*.

Poznań Voivodeship:

7. Chorzępowo (10km NW of Sieraków). Forest dunes near the Kłosowskie Lake.
8. Oborniki - a forest sand and clay heading.
9. Bąblin (10 km NW of Oborniki) - on a wooden barn.
10. Rakownia (2 km SW of Murowana Goślina) - on an old wooden storehouse.
11. Bolechowo (15 km N of Poznań) - on forest dunes, from *Thymus sp.* and *Helichrysum arenarium* numerous specimens of *Hedychrum* were collected. Farm buildings - brick joints, old timber of crossbars and thatch.
12. Biedrusko (15 km N of Poznań) - the area round forest division buildings.
13. Komorniki (12 km SW of Poznań) - an old gravel pit in the forest. The insects were collected mainly from *Helichrysum arenarium* and *Achillea millefolium*.
14. Krajkowo (20 km S of Poznań) - and old wooden barn among the fields.
15. Rogalin (15 km S of Poznań) - from the trunks of old oak trees on the Warta River valley.
16. Poznań-Fabianowo. Clay wall joints of an old house, also representatives of *Omalus* on the leaves of a plum tree (honey dew).
17. Poznań - Malta. On the edge of the town forest.

Leszno Voivodeship:

18. Turew (15 km E of Kościan). Village park and shelterbelts.
19. Rogaczewo W. (15 km E of Kościan) - shelterbelts.
20. Gołębin Stary (15 km E of Kościan) - shelterbelts.
21. Gołębin Stary (15 km E of Kościan) - edges of the road in the field.

3. Species composition

As a result of the performed studies the occurrence of 36 species of *Chrysididae* has been stated (Tab. 1). This is quite a significant number in comparison with 43 species of *Chrysididae* displayed so far by different investigators from the entire Wielkopolsko-Kujawska Lowland. The useful-

ness of the undertaken studies is supported by the fact of finding two species, *Hedychridium femoratum* and *Chrysis splendidula*, not mentioned before among insects occurring on the territory of Poland.

Hedychridium femoratum (Dahlbom, 1854) is distributed around the Mediterranean Sea and in warmer parts of Central Europe up to Czechoslovakia (Linsenmaier 1951, Noskiewicz and Puławski 1958, Tyrner 1980). Its life history is unknown.

Station in Poland: Chodzież, 19 August, 1984 - 1 specimen on the sand of a forest dune (leg. A. Kochanowski).

Chrysis splendidula Rossi, 1790 - inhabits North Africa, South-Western Asia and Southern and Central Europe. According to Noskiewicz and Puławski (1958) and Banaszak (1980) records of this species by Torka (1910, 1917) and Szulczewski (1917, 1950) from the territory of the Wielkopolska region concern in reality *Ch. rutilans* Oliv.

Chrysis splendidula differs from *Ch. rutilans* by a stumpy body structure and green coloration of sternite II over its significant part and sternite III wholly.

Stations in Poland: Waldowice, 21 August, 1983, 1 specimen on *Achillea millefolium* in the felling area; Oborniki, 13 September, 1987, 1 specimen in the forest sand heading; Bolechowo, 28 July, 1984, 2 specimens on the thatch of an old building (leg. A. Kochanowski).

Some of the found species deserve special attention from biological or zoogeographical point of view as little known or attaining the end of their general range in Poland. Moreover, four species, *Hedychrum aureicolle niemei*, *Chrysis pustulosa*, *Ch. angustula* and *Ch. valida*, have not hitherto been mentioned among the species known from that area.

Notozus constrictus Foerster, 1853 is reported by many investigators almost from the entire Poland, but it should be noted that all discovered and referred to this species specimens have claws with two preterminal jags (totally three jags). On that basis Trautmann (1927) and after him Noskiewicz and Puławski (1958) distinguish another species - *Notozus sanzii* Gogorza. This trait, however, was not completely taken into consideration by Linsenmaier (1959), distinguishing *N. sanzii* form *N. constrictus* on the basis of tergite III apex. According to that investigator a lamellar-ended notch on the

posterior margin of tergite III in *N. sanzii* is crescent-shaped and rather shallow, whereas in *N. constrictus* the notch is deep and resembles a horse-shoe in its shape. Such very deep notch of tergite III can be found in specimens from western Poland referred to the mentioned above species.

Omalus aeneus (Fabricius, 1787). This species widely spread in the western Palearctic is known as a parasite of *Sphecidae* from the genera *Pemphredon* Latr., *Passaloecus* Schenck and *Stigmus* Panz. (Trautmann 1927, Noskiewicz and Puławski 1958, Balthasar 1954). The authors of the present paper have in their collections also a specimen of *O. aeneus* provided with a label, from which it follows that it was reared from *Evetria resinella* L. larva on June 8, 1956, collected (leg. J. Mirek) in the Biedrusko Forest Division near Poznań on April 3, 1956. This information, undoubtedly requires a confirmation taking into consideration the fact that very few species of chrysidids have *Lepidoptera* as their hosts (Noskiewicz, Puławski 1958).

Hedychrum nobile - *H. micans* - *H. aureicolle niemelai* group requires broader consideration.

Hedychrum nobile (Scopoli) belongs to species commonly occurring in Poland. Noskiewicz and Puławski (1958) separate *H. micans* Lucas from that species after Verhoeff (1950). In addition to that in 1959 Linsenmaier described a related form, which he recognized as a subspecies of *H. aureicolle* Mocsáry and named it *H.a.niemelai*.

Noskiewicz and Puławski (1958) distinguish males of *H.nobile* from those of *H. micans* mainly on the basis of pubescence of sternites II and III, which is longer and thicker in *H.nobile*. However, a more distinct trait, differing these two species, is a depression on the median tibia. According to Linsenmaier (1959) this depression is less distinct in *H.nobile*, but is distinct and acutely pressed in *H. micans*. Females of the both species can be differentiated quite easily on the basis of a notch on the posterior margin of sternite III, which is wider in *H.micans* and has a smaller tooth in the middle than in *H.nobile*. In turn *H.a. niemelai* differ from *H.micans* by the pubescence of the thorax: in males of *H.a.niemelai* the hairs covering the thorax are shorter than those on the head, whereas in *H. micans* pubescence of the upper part of the thorax is very short, being half as short as that on the head; in females of *H.a.niemelai*

hairs of the thorax are short and very dark, whereas in *H. micans* the hairs covering that part of the body are very short and whitish (Linsenmaier 1959).

In the studying material for the present work *H. nobile* was represented most numerous (15%). In July and August 43 ♀♀ and 59 ♂♂ were captured. This species was encountered most frequently on the sands of forest dunes and forest edges, where it visited flowers of *Compositae*, particularly *Achillea millefolium* and *Jasione montana*. It can be also encountered in other habitats, which is related with its biological properties. *H. nobile* has many hosts living under various habitat conditions, for instance, *Cerceris arenaria* (L.) - characteristic of sands, *Lasioglossum leucozonium* (Schrank) - grasses, meadows, edges of fields and forests, *Osmia nigriventris* (Zetterstedt) - forests and their edges, *Chalicodoma muraria* (Fabr.) - rocks, *Odynerus parietum* (L.) - clay and loessal slopes.

Hedychrum micans was definitely less numerous presented in the collected material: in July and August 19 specimens (17 ♀♀ and 2 ♂♂) were captured in sandy places on *Achillea millefolium* and *Carduus* sp. In view of the fact that *H. micans* has not been long differentiated from *H. nobile*, data on the biology and distribution of the last one partially concern also *H. micans*. In Poland it was mentioned from the vicinities of Poznań and Częstochowa (Banaszak 1980).

Hedychrum aureicolle niemelai only recently has been found in Poland (Banaszak 1980). It is spread throughout Europe. According to Linsenmaier (1959) it parasitize *Cerceris* Latr. If *H. nobile* s.str. is associated chiefly with loose sands, *H. a. niemelai* according to the suggestions of Petit (1975) is less requiring with regard to the soil structure and its origin. The material collected in western Poland originates from the field habitat (Turew, 20 ♀♀ and ♂♂ and from sands (Glisno - 1♂).

Hedychridium zelleri (Dahlbom, 1845) inhabits North and Central Europe. It occurs very locally on sands. In Poland it was reported to occur in single stations in the western part of the country from Pomerania to Silesia. A new station: Chodzież, 28 July, 1985, 2 specimens on the sand.

Hedychridium integrum (Dahlbom, 1831) is very similar to *H. purpurascens* (Dahlbom) regarding both morphology and distribution, i.e. it inhabits North (to Finland) and Central Europe. In Poland it was reported from single

habitats in Wielkopolska and Silesia. According to Trautmann (1927) it is a parasite of *Gorytes lunatus* (Dahlbom).

A new station: Chodzież, 19 August, 1984 and 28 July, 1985, three specimens on the sand.

Cleptes pallipes Lepeletier, 1806 (*C.diana* Moscard, 1889). Linsenmaier (1959) considers it to be a synonym of *C. semiauratus* (Linnaeus 1761). In turn the description of *C.semiauratus* (L.) from the identification key of *Cleptidae* of Poland by Noskiewicz and Puławski (1958) is similar to the description of Linsenmaier (1959) concerning *C.splendens* Fabricius, 1804.

In the Polish faunistic literature the most frequently mentioned species is *C.semiauratus* (Siebold 1844, Brischke 1887, Rdoszkowski 1865, Niezabitowski 1900, Dittrich 1911, Fudakowski 1920, Szulczewski 1917, 1950, Torka 1917, Niesiołowski 1949). *Cleptes pallipes* from the territory of Poland was mentioned by Parré (1950) from Łódź and its vicinities, as well as by Głowacki (1953) from Podkowa Leśna near Warsaw. Noskiewicz and Puławski (1958) referred both these names to two different species, writing that they were mistaken by the mentioned faunists, though they did not prove that. New stations: Turew, 30 July, 1965, 1 ♀; Turew, 1979, 1 ♂, 3 ♂♂; Poznań, 1974, 1 ♀.

Cleptes nitidulus Fabricius, 1793. Noskiewicz and Puławski (1958) consider it to be a widespread but a rare species in Poland. Szulczewski (1917, 1950) mentions it from Wielkopolska, Drogoszewski (1934) from Łowicz, Siebold (1844) and Brischke (1887) from Pomerania and Dittrich (1911) from Silesia.

New stations: Turew, 22 April, 1976, 1 ♀ on maize field; Gołębin Stary, 29 July, 1977, 1 ♀ on the roadside belt.

4. Ecological Remarks

4.1. Domination Structure

Chrysidids were captured in the places of numerous nesting of their hosts, and flowering plants were searched for the largest number of their specimen and species. All encountered individuals or almost all of them in the case of the most numerous species, such as *Chrysis ignita* and *Ch.*

cyanea, were caught. It makes possible to estimate relative numbers of the studied fauna.

The portion of individual species in relation to all captured *Chrysididae* is within 0.1-34.4%.

A definitive dominant species, covering 34.5% of the collected material was *Chrysis ignita*. Subdominant were *Hedychrum nobile* - 15.0% and *Chrysis cyanea* - 12.0%. Each of the remaining species did not exceed 5.0%.

It should be noticed that *Chrysis ignita* was observed almost exclusively on various kinds of walls, clay or wooden, but very rarely in sandy places. Opposite to it, *Hedychrum nobile* was observed very numerously in dune habitats, on the sand or on the flowers occurring in these habitats.

4.2. Environmental Preferences

Most of their energy and time *Chrysididae* use for finding the nests of their hosts. It is not surprising, therefore, that the majority of chrysidids - about 85% were caught just during their flight in the neighbourhood of their hosts' nests. The remaining part was captured on the flowers.

It is generally known that these insects can be encountered on the wood, on the walls of clay buildings, in sandy places, i.e. wherever representatives of *Apoidea*, *Sphecoidea* and *Vespoidea* have their numerous nests. Table 2 summarizes the found *Chrysididae* species according to the places of their discovery.

While regarding the number of species and specimens the reachest habitats appeared to be wooden walls of old buldings, old trees, pillars and wooden fences (Fig. 1). Ten species (Table 2), including the dominant *Chrysis ignita* and the subdominant - *Ch. cyanea*, constituting together 61.6% of the collected material were found on such wooden objects and in their immediate neighbourhood.

It should be emphasized that old trees or old dead logs (trunks) may be a place of living of entire insect communities. On the old oak trees (*Quercus robur*) in Rogalin near Poznań Banaszak (1977) revealed the occurrence of 39 *Hymenoptera* species including 4 species from the genus *Chrysis* (*Ch. gracilima*, *Ch. cyanea*, *Ch. fulgida* and *Ch. ignita*).

On old wooden pillars of fences in Lower Saxony Haeseler (1979) similarly found the nests and occurrence of a large community numbering 54 species of *Aculeata*, and among them representatives of *Chrysis* (*Ch. angustula*, *Ch. cyanea*, *Ch. gracillima*, *Ch. immaculata* Buyss. and *Ch. ignita*).

On the clay walls of old buildings 6 species were found; the most numerous was also *Chrysis ignita* (47.0%) and subdominant were *Ch. austriaca* (21.5%) and *Ch. cyanea* (21.5%). *Chrysis austriaca* was caught exclusively on that type of walls and that habitat seems to be typical for it because the nests of its hosts belonging to the genera *Osmia* Panz. and *Odynerus* Latr. commonly occur inside such walls. Clay walls of village buildings may be a place of occurrence of a large number of *Hymenoptera* so the occurrence of their parasites in the same habitats is not surprising. In the vicinity of Poznań Banaszak (1970) found 23 species on such walls, among them *Apoidea* (13 species), *Vespidae* (2), *Chalcididae* (1), *Evanidae* (1), *Ichneumonidae* (1) and *Chrysididae* (*Hedychridium roseum*, *Chrysis austriaca*, *Ch. fulgida*, *Ch. nitidula* and *Ch. ignita*). Some a complex character of the habitat for these insects represent buildings of timber construction with clay filling – so-called half-timbered walls. On the walls of that type 5 species were commonly captured, including dominant *Chrysis ignita* (66.7%) and subdominant *Ch. cyanea* (25.0%).

It should be stressed that the described walls, both wooden and clay, are the place of occurrence first of all of representatives of the genus *Chrysis* L. Whereas other genera, such as *Hedychridium roseum* and *H. coriaceum*, were rather seldom represented.

The communities of *Chrysididae* in sandy habitats distinguish sharply from those of synanthropical environments represented by walls of different types of buildings. The dominants of the former are species belonging to the genera *Hedychrum* Latr. and *Hedychridium* Abeille. Totally 10 species (Table 2) including notably dominant *Hedychrum nobile* - 66.4% (Fig. 1), were found here.

4.3. Feeding Plants

In course of presented here searches on *Chrysididae* various habitats were penetrated and frequently, beside the place of their hosts, potential

feeding habitats with flower vegetation were also studied. Adult chrysidids feed flower nectar and may - alongside other *Aculeata* - pollinate flowers to a larger or smaller extent. On the whole 15.7% of chrysidids were captured on the flowers. This may suggest a relatively smaller "flower-lovability" for instance, in comparison to bees. However, if we try to consider individual genera and species, it will appear that chrysidids display a very different extent of that "flower-lovability". Representatives of *Hedychrum* Latr. are observed on the flowers most frequently. Out of 172 specimens nearly 60% were captured on the flowers. In particular *Hedychrum nobile* seems to be strongly associated with flowers, that out of 107 captured specimens of 48 ♂ and 28 ♀ were met on the flowers. That observation is in contradiction with the statement of Petit (1975) who was considered *Hedychrum nobile* s.l. as a little flower-loving species.

The performed studies have shown that representatives of the remaining genera of chrysidids seldom observed on the flowers, are of a relatively small requirement for flower food like in the case of *Hedychridium* Abeille, or sporadically met *Chrysis* L. Some of them (e.g. *Omalus* Panz.) were not observed on the flowers at all. It should be noted that the most numerous captured species - *Chrysis ignita* - was only in a single case observed on the flower (*Carduus* sp.). This may suggest that some chrysidids are of smaller energetic requirements or that they use other feed sources, for instance honey dew, plant juice etc. That suggestion may be supported by an observation of a very abundant flight of *Omalus auratus* and *Chrysis cyanea* over plum leaves, most probably gathering honey dew (Poznań-Fabianowo, 29 August, 1987).

A list of chrysidids visiting individual plants and the portion of the studied insects in flights over flowers are presented in Table 3. It markedly points out to a large importance of flowers of the family of *Umbelliferae* and *Achillea millefolium* (*Compositae*) as a source of nectar for *Chrysididae*. The tongue of chrysidids is very short, usually not stretching beyond the closed mandible so they can only use open and easily accessible flowers.

REFERENCES

- Balthasar V. 1954. Zlatenky - Chrysoidea (Rád: Blankokridli - *Hymenoptera*). Fauna ČSR, 3. Praha, 271 pp.
- Banaszak J. 1970: Spostrzeżenia nad fauną błonkówek (*Hymenoptera*) gli-
nianych ścian zabudowań wiejskich w środkowej Wielkopolsce. Bad.
Fizjogr. Pol. Zach., Poznań, 23: 231-233
- Banaszak J. 1977. Błonkówki (*Hymenoptera*) spotykane na dębach roga-
lińskich. Bad. Fizjogr. Pol. Zach., Poznań, 30:109-115.
- Banaszak J. 1980. Złotolitki - *Chrysididae*. Katalog Fauny Polski, XXVI, 3,
Warszawa, 52 pp.
- Brischke C.G.A. 1887: *Hymenoptera aculeata* der Provinzen West-und Ost-
preussen. Ber. Westpr. Bot.-Zool. Ver., Danzig, 10: 56-72
- Dittrich R. 1911: Verzeichnis der bisher in Schlesien aufgefundenen Hyme-
nopteren. III. Rapacia. Jh. Ver. Schles. Ins. K., Breslau, 4: 15-34
- Drogoszewski K. 1934: Nowe dla Polski Środkowej żądłówki. Pol. Pismo Ent.,
Lwów, 13: 125-131
- Fudakowski J. 1920: Materiały do fauny złotek (*Chrysididae*) Polski. Cz. 2.
Złotki b. Królestwa Kongresowego. Spraw. Kom. Fizjogr., Kraków, 53-
54: 149-152
- Głowacki J. 1953. Przyczynek do znajomości błonkówek (*Hymenoptera*) okolic
Warszawy. Fragm. Faun. Mus. Zool. Pol., Warszawa, 6: 501-522
- Haeseler V. 1979: Landschaftsökologischer Stellenwert von Zaunpfählen am
Beispiel der Nistgelegenheiten für solitäre Biennen und Wespen (*Hym.*
Aculeata). Natur u. Landschaft, Stuttgart, 54, 1: 8-13
- Linsenmaier W. 1951: Die europäischen Chrysididen (*Hymenoptera*). Mitt.
Schweiz. Ent. Ges., Lausanne, 24: 1-110.
- Linsenmaier W. 1959: Revision der Familie *Chrysididae* (*Hymenoptera*). Mitt.
Scheiz. Ent. Ges., Lausanne, 32: 1-232
- Niesiolowski W. 1949: Przyczynek do fauny żądłówek Polski południowej. Pol.
Pismo Ent., Wrocław, 19: 221-228
- Niezabitowski E.L. 1901: Materiały do fauny złotek (*Chrysididae*) Galicji.
Spraw. Kom. Fizjogr., Kraków, 35: 35-40. (odb. z 1900 r.)
- Noskiewicz J., Puławski W. 1958: Złotolitki - *Chrysididae*, *Cleptidae*. Klucze



- do oznaczania owadów Polski, XXIV, 55-56, Warszawa, 65pp.
- Parré F. 1950. Hymenopteren aus der Umgebung von Łódz und eine für Stassfurt neue Apidenart. Mitt. Mus. Naturk. (Kulturg). Magdeburg, 2: 175-178
- Petit J. 1975: Les Chrysidés de la Faune Belge (*Hymenoptera Chrysididae*). Notes faunistiques et ethologiques (3). Rev. Verviét. Hist. Nat., 32 (10/12): 58-64
- Radoszkowski O. 1865: Enumeration des especes de Chrysidés de Russie. Horae Soc. Ent. Ross., S. Petersburg, 3: 295-310
- Siebold C. 1844: Beiträge zur Fauna der wiebellosen Thiere Preussens. Vaterl. Arch. Wiss., Königsberg, 10: 121-133
- Skibińska E. 1981: Żądłowki (*Aculeata, Hymenoptera*). Fragm. Faun., 26: 355-378
- Szulczewski J.W. 1917: Beitrag zur Chrysididenfauna der Provinz Posen. Z. Naturw. Abt. Dtsch. Ges. Posen, 24: 29-35
- Szulczewski J.W. 1950: Błonkówki (*Hymenoptera*) Wielkopolskiego Parku Narodowego. Cz. IV. Żądłowki (*Aculeata*). Pr. Monogr. Przyr. Wielkop. Parku Nar. PTPN, Poznań, 2, 6: 1-20
- Torka V. 1910: Hymenopteren der Provinz Posen. Z. Naturw. Abt., Posen, 17, 2: 33-43
- Torka V. 1917: Goldwespen (*Chrysidae*) aus Posen. Z. Naturw. Abt., Posen, 23, 4: 21-27
- Trautmann W. 1927: Die Goldwespen Europas. Lautawerk. Weimar, 194 pp.
- Tyrner P. 1980: K taxonomii a faunistice zlatenek (*Hymenoptera, Chrysididae*) Československa. Sbor. Okr. Muz. v Moste, 2: 23-31
- Verhoeff P. M. F. 1950: Taxonomie der niederländischen *Hedychrum*-Arten (*Hedychrum* Latr., *Hym.*, *Chrys.*). Publ. Natuurhist. Genootschap in Limburg, Maastricht, 3: 1-8

STRESZCZENIE

Materiały do znajomości *Chrysididae* (Hymenoptera) Polski zachodniej

Praca zawiera wyniki kilkuletnich badań nad składem gatunkowym i ekologią *Chrysididea* w zachodniej części Niziny Wielkopolsko-Kujawskiej. Wykazano ogółem 36 gatunków (Tab. 1.), wśród nich dwa gatunki są nowe dla fauny Polski: *Hedychridium femoratum* i *Chrysis splendidula*. Cztery gatunki nie były dotychczas wymieniane z Niziny Wielkopolsko-Kujawskiej: *Hedychrum aureicolle niemelai*, *Chrysis pustulosa*, *Ch. angustula* i *Ch. valida*.

Miejscami najliczniejszego występowania złotolitek (33.2% zebranego materiału) były drewniane ściany budowli, stare drzewa itp. Stwierdzono na nich i w bezpośrednim sąsiedztwie 10 gatunków (Tab. 2), wśród których zdecydowanie dominowała *Chrysis ignita* (61,6%). Gatunek ten był również najliczniejszy na glinianych ścianach starych budynków, gdzie stanowił 47,0%. Należy podkreślić, że wszelkie ściany, gliniane i drewniane, są miejscem występowania przede wszystkim przedstawicieli rodzaju *Chrysis* L. Zgoła odmienną od wyżej omówionych (synatropijnych) miejsc fauną złotolitek odznaczają się siedliska piaszczyste, gdzie wyraźnie przeważają przedstawiciele *Hedychrum* Latr. i *Hedychridium* Ab. Wśród 10 gatunków stwierdzonych na piaskach wybitnie dominował *Hedychrum nobile*, stanowiąc 64,6% zebranego stamtąd materiału.

Stwierdzono, że imagines wykazują bardzo różny stopień uzależnienia od pokarmu kwiatowego. Największy związek z kwiatami (pokarmem kwiatowym) wykazują przedstawiciele *Hedychrum*, zwłaszcza *H. nobile*. Najczęściej odwiedzane były kwiaty *Umbelliferae* oraz *Achillea millefolium* L. (Tab. 3). Przedstawiciele innych rodzajów na kwiatkach łowiono sporadycznie albo wcale nie obserwowano. Prawdopodobnie korzystają one z innego źródła pokarmu, np. zbierają spadź, jak *Omalus auratus* i *Chrysis cyanea*.

Table 1.

A systematic list of *Chrysididae* from western Poland; x - species not reported so far from Poland; xx - species not reported from the Wielkopolsko-Kujawska Lowland

No.	Species	Specimen number	Stations
1	<i>Notozus constrictus</i> Foerster	3	5, 6, 18
2	<i>Omalus truncatus</i> (Dahlbom)	12	16
3	<i>Omalus bidentulus</i> (Lepeletier)	5	1
4	<i>Omalus pusillus</i> (Fabricius)	23	18
5	<i>Omalus aeneus</i> (Fabricius)	2	12, 18
6	<i>Omalus auratus</i> (Linnaeus)	15	5, 16
7	<i>Holopyga amoenula</i> Dahlbom	2	1, 18
8	<i>Hedychrum nobile</i> (Scopoli)	107	1-3, 5-7, 11, 13, 18
9	<i>Hedychrum micans</i> Lucas	19	1, 5, 6, 17
10	<i>Hedychrum intermedium</i> Dahlbom	3	5, 11, 13
11	<i>Hedychrum gerstaeckeri</i> Chevrièr	22	5, 13, 17, 18
xx12	<i>Hedychrum aureicollè niemelat</i> Linsenmaier	21	5, 18
13	<i>Hedychridium zellert</i> (Dahlbom)	2	6
x14	<i>Hedychridium femoratum</i> (Dahlbom)	1	6
15	<i>Hedychridium roseum</i> (Rossi)	3	5, 7, 16
16	<i>Hedychridium ardens</i> (Coquebert)	4	1, 5, 18, 19
17	<i>Hedychridium coriaceum</i> (Dahlbom)	2	5, 16
18	<i>Hedychridium integrum</i> (Dahlbom)	3	6
19	<i>Chrysis gracillima</i> Foerst	5	10, 11, 16
20	<i>Chrysis austriaca</i> Fabricius	14	1
xx21	<i>Chrysis pustulosa</i> Abeille	4	15
22	<i>Chrysis bicolor</i> Lepeletier	2	5, 6
23	<i>Chrysis succincta</i> Linnaeus	1	4
24	<i>Chrysis cyanea</i> Linnaeus	86	1, 5, 6, 9, 10, 11, 15-18
25	<i>Chrysis iris</i> Christ	14	15
26	<i>Chrysis fulgida</i> Linnaeus	16	6, 10, 15
27	<i>Chrysis viridula</i> Linnaeus	9	6, 10, 16
x28	<i>Chrysis splendidula</i> Rossi	5	2, 8, 11
29	<i>Chrysis sybarita</i> Foerster	17	11, 15
xx30	<i>Chrysis angustula</i> Schenck	24	1, 5, 6, 15

No.	Species	Specimen number	Stations
31	<i>Chrystis ruddi</i> Shuckard	1	15
xx32	<i>Chrystis valda</i> Mocsary	5	5, 6, 11, 15
33	<i>Chrystis longula</i> Abeille	9	6, 14, 15, 18
34	<i>Chrystis ignita</i> Linnaeus	244	1, 5, 6, 11, 14-18
35	<i>Cleptes pallipes</i> Lepeletier	6	17, 18
36	<i>Cleptes nitidulus</i> (Fabricius)	2	18, 20

Table 2.Environmental preferences of *Chrysididae*

Species	Total number of collected specimens	searching for hosts' nests					Feeding flights (flowers)
		sand	clay walls	clay and wooden walls	wood; walls, trees, poles	other biotopes in flight	
<i>Notozus constrictus</i>	3					1	2
<i>Omalus truncatus</i>	12					12	
<i>Omalus bidentulus</i>	5	5					
<i>Omalus aeneus</i>	2					2	
<i>Omalus auratus</i>	15				1	14	
<i>Omalus pusillus</i>	23					23	
<i>Holopyga amoenula</i>	2					1	1
<i>Hedychrum nobile</i>	107	31				5	71
<i>Hedychrum micans</i>	19	2					17
<i>Hedychrum a. niemelai</i>	21					21	
<i>Hedychrum intermedium</i>	3					1	2
<i>Hedychrum gerstaeckeri</i>	22	1				16	5
<i>Hedychridium zelleri</i>	2	2					
<i>Hedychridium femoratum</i>	1	1					

Species	Total number of collected specimens	searching for hosts' nests					Feeding flights (flowers)
		sand	clay walls	clay and wooden walls	wood; walls, trees, poles	other biotopes in flight	
<i>Hedychridium roseum</i>	3	1				1	1
<i>Hedychridium ardens</i>	4					2	2
<i>Hedychridium cortaceum</i>	2			1			1
<i>Hedychridium integrum</i>	3	2				1	
<i>Chrysis gracillima</i>	5		1			4	
<i>Chrysis austriaca</i>	14		14				
<i>Chrysis pustulosa</i>	4				4		
<i>Chrysis bicolor</i>	2						2
<i>Chrysis succincta</i>	1	1					
<i>Chrysis cyanea</i>	86		14	21	45	6	
<i>Chrysis iris</i>	14				14		
<i>Chrysis viridula</i>	9		2	5		2	
<i>Chrysis splendidula</i>	5	2				2	1
<i>Chrysis sybarita</i>	17		3		14		
<i>Chrysis ruddi</i>	1				1		
<i>Chrysis valida</i>	5				1	4	
<i>Chrysis longula</i>	9				6	3	
<i>Chrysis ignita</i>	244		31	56	146	10	1
<i>Chrysis fulgida</i>	16					16	
<i>Chrysis angustula</i>	24			1	5	17	1
<i>Cleptes pallipes</i>	6					6	
<i>Cleptes nitidulus</i>	2					2	
Chrysididae: specimen No.	713	48	65	84	237	172	107
species No.	36	10	6	5	10	24	13

Table 3.

Feeding plants of *Chrysididae* and the portion of insects in the flight over flowers of different species

Plant <i>Chrysididae</i>	<i>Umbelliferae</i>	<i>Achillea millefolium</i>	<i>Cardus sp.</i>	<i>Matricaria chamomilla</i>	<i>Jasione montana</i>	<i>Helichrysum arenarium</i>	Total number of collected specimens	Number of specimens collected on flowers
<i>Hedychrum noble</i>	+	+	+	+	+		107	71
<i>Hedychrum micans</i>	+	+					19	17
<i>Hedychrum gerstaeckert</i>	+	+				+	22	5
<i>Hedychridium ardens</i>	+	+					4	2
<i>Notozus constrictus</i>	+						3	2
<i>Holopyga amoenula</i>	+						2	1
<i>Hedychridium roseum</i>	+						3	1
<i>Hedychridium cortaceum</i>	+						2	1
<i>Chrysis bicolor</i>	+						2	2
<i>Hedychrum intermedium</i>		+					3	2
<i>Chrysis splendida</i>		+					4	1
<i>Chrysis angustula</i>		+					24	1
<i>Chrysis ignita</i>			+				246	1

Fig. 1. Dominance structure of *Chrysididae* communities in the places of the hosts' nesting

- A - sand (a - *Hedychrum nobile*, b - *Omalus bidentulus*),
 B - clay walls (a - *Chrysis ignita*, b - *Ch. austriaca*, c - *Ch. cyanea*),
 C - clay and wooden walls (a - *Ch. ignita*, b - *Ch. cyanea*);
 D - wood (a - *Ch. ignita*, b - *Ch. cyanea*).

