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THE GREEN LACEWINGS IN BELGIUM (NEUROPTERA: CHRYSOPIDAE)

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There are merely three published sources of information on the green lacewings in Belgium. The first two were written by a Belgian and a Catalan author at the beginning of the 20th century and the third was published in 1980. Interestingly, the most recent study reported the fewest species (11), the most previous contained 12 and the second one showed 17 species.
This confused situation and the paucity of data initiated the authors to identify the green lacewing collection of the Gembloux University of Agricultural Sciences, where lacewings from different parts of Belgium were preserved, and also to collect chrysopids regularly.
Summarising the species reported in the literature and caught during sampling, 18 green lacewing species have been verified in Belgium: *Nothochrysa fulviceps, Nothochrysa capitata, Hypochrysa elegans, Nineta flava, Nineta vittata, Nineta pallida, Chrysotropia ciliata, Chrysopa perla, Chrysopa dorsalis, Chrysopa abbreviata, Chrysopa formosa, Chrysopa phyllochroma, Chrysopa pallens, Dichochrysa flavifrons, Dichochrysa prasina, Dichochrysa ventralis, Chrysoperla carnea, Cunctochrysa albolineata.* Considering the known references, one species, *Nineta pallida* proved to be new for the Belgian fauna.

Key words: Chrysopidae, Belgium

INTRODUCTION

Information on green lacewings of Belgium is quite scarce. One can find only three sources of data of which the first two at the beginning of the 20th century were written by a Belgian (LAMEERE 1900) and a Catalan author (NAVÁS 1913). Unfortunately no more Belgian contribution has been published on this subject. The third source is the well-known work of ASPÖCK *et al.* (1980). Although it is the most recent study referring to Belgian aspects of Chrysopidae, it reported the fewest (11) species: *Nothochrysa fulviceps* (STEPHENS, 1836), *Nothochrysa capitata* (FABRICIUS, 1793), *Nineta vittata* (WESMAEL, 1841), *Chrysotropia ciliata* (WESMAEL, 1841), *Chrysopa dorsalis* BURMEISTER, 1839, *Chrysopa abbreviata* CURTIS, 1834, *Chrysopa formosa* BRAUER, 1850, *Anisochrysa (=Dichochrysa) flavifrons* (BRAUER, 1850), *Anisochrysa (=Dichochrysa) prasina* (BURMEISTER, 1839), *Anisochrysa (=Dichochrysa) ventralis* (CURTIS, 1834), *Chrysoperla carnea* (STEPHENS, 1836) [*Chrysoperla carnea* is meant in this paper as *Chrysoperla*

carnea sensu lato]). The earliest (LAMEERE 1900) recounted 12 (*Nothochrysa fulviceps, Nothochrysa capitata, Chrysopa (= Nineta) vittata* WESMAEL, 1841, *Chrysopa (= Nineta) flava* SCOPOLI: HÖLZEL 1965, *Chrysopa alba* (LINNAEUS): STEPHENS 1836 *(=Chrysotropia ciliata), Chrysopa septempunctata* WESMAEL, 1841 (=*pallens* (RAMBUR, 1838)), *Ch. abbreviata*, *Chrysopa phyllochroma* WESMAEL, 1841, *Chrysopa (= Dichochrysa) flavifrons* BRAUER, 1850, *Chrysopa (=Dichochrysa) ventralis* CURTIS, 1834, *Chrysopa perla* (LINNAEUS, 1758), *Chrysopa vulgaris* SCHNEIDER, 1851 (=*Chrysoperla carnea*)) and NAVÁS (1913) pointed out 17 species (*Nothochrysa fulviceps, Nothochrysa capitata, Hypochrysa nobilis* HEYDEN (sic!) (=*elegans* BURMEISTER, 1839), *Nineta vittata, Nineta flava* (SCOPOLI, 1763), *Ch. alba, Ch. septempunctata, Ch. abbreviata, Ch. phyllochroma, Ch. flavifrons, Chrysopa (=Dichochrysa) prasina* BURMEISTER, 1839, *Ch. ventralis, Ch. perla, Ch. formosa, Ch. dorsalis, Ch. vulgaris, Chrysopa tenella* SCHNEIDER, 1851 (=*Cunctochrysa albolineata* (KILLINGTON, 1935)). Besides the aforementioned published material MAGIS (1980, unpubl.) identified nine species: *Ch. carnea, Ch. perla, Ch. pallens, Ch. phyllochroma, Ch. ventralis, Chrysotropia ciliata, D. flavifrons, D. prasina, Nineta flava* and SÉMÉRIA (1981, unpubl.) one taxon, *Nineta vittata*.

This bewildering situation and the insufficiency of data initiated us to identify the green lacewing collection of the Gembloux Agricultural University, where lacewings from different parts of Belgium (mainly from the territory of the French-speaking Community) were preserved, and also to start a more or less regular collection of chrysopids at least in the surroundings of Gembloux in order to make a revision of Belgian chrysopids and to prepare an up-to-date checklist.

SITES AND METHODS OF COLLECTION

The first data were gained by determination of the pinned material of the Gembloux Agricultural University. Unfortunately one part of the specimens was damaged which often prevented the determination of the sex. These individuals are represented by the abbreviation of "adult" (ad). The deficiency and illegibility of some of the labels resulted in troubles, too: it was not possible to define partly the true and exact date and place of collection and practically there was no information on the method of collection and the habitat where the lacewings were captured. The probable imprecise details are represented by question mark(s). Administrative areas appear after the locality in parenthesis.

In 1995 (from July 12 until October 22) and 1997 (from June 7 till August 13) (samples were taken by using sweep net (30 cm diameter; 100 sweeps per sample) mainly in the territory of the Gembloux Agricultural University (Gembloux, Belgium). Sampled localities were: Experimental Area, Botanical Garden, Park of the Agricultural University, Natural Reserve of Gembloux and an uncultivated garden. In most cases living specimens were identified immediately after capturing or they were preserved in a 5% glycerol solution in 70% ethanol. Individuals were determined according to the descriptions of ASPÖCK *et al.* (1980).

RESULTS AND DISCUSSION

Pinned lacewings from the Collection of the Gembloux Agricultural University

Chrysoperla carnea (STEPHENS, 1836) *sensu lato*

Without date: ♀ Montigny?; ♀ Houtain-Saint- Siméon (Oupeye)

1983: 03.02 (= the 3rd February) ♀ Saint Servais (Namur); 03.06 ♀ Embourg (Chaudfontaine); 15.07 ♂ Marloie (Marche-en-Famenne); 19.07 ad Sart-Custinne (Gedinne)0; 20.07 ♂ Forest (Forest); 21.07 ♀ Chatelineau (Châtelet); 21.07 ♂ Gembloux (Gembloux); 26.07 ♂ Jette (Jette); 30.07 ♀ Slins (Juprelle); ??.08 ♂ Bruxelles (Bruxelles); 05.08 ♀ Jemappes (Mons); 17.08 ♀ Longueville (Chamant-Gistoux); 27.08 ♀ Ottignies (Louvain-la-Neuve); 30.08 ♀ Mons (Mons); 31.08 ♀ Gembloux (Gembloux); 08.09 ♀ Gembloux (Gembloux); 07.09 ♀ Rochefort (Rochefort); 17.09 ♀ Andoy (Namur); 28.09 ♀ La Louvière (La LouviPre); 01.10 ♀ Libin (Libin); 03.10 ad Châtelet (Châtelet); 09.10 ♀ Bourdon (Hotton); 10.10 ♂ Bruxelles (Bruxelles); 11.10 ♀ Rochefort (Rochefort);17.10 ♂ Gembloux (Gembloux); 28.10 ♀ Aiseau (Aiseau-Presles); 08;11 ♀ Mettet (Mettet); 08.11 ♀ Mettet (Mettet); 05.12 ♂ Lustin (Profondeville); 11.12 ♀ Rochefort (Rochefort)

1984: 22.?? ♀ Gembloux (Gembloux); ??.?? ♀ Tihange (Huy); 22.?? ♀ Nethen (Grez-Doiceau); 21.01 ♀ Lompret (Chimay); 02.02 ♂ Stembert (Verviers); 20.02 ♂ Fontaine l'Evêque (Fontaine l'Evêque); 03.03 ♂ Saint-Hubert (Saint-Hubert); 08.04 ♂ Aiseau (Aiseau-Presles); 0904 ♀ Awans (Awans); 10.04 ♂ Jambes (Namur); 11.04 ♂ Lisogne (Dinant); 11.04 ♀ Ciply (Mons); 13.04 ♀ Beausaint (La Roche-en-Ardenne); 15.04 ♀ Verviers (Verviers); 15.04 ♀ Gembloux (Gembloux); 15.04 ♀ Esneux (Esneux); 16.04 ♀ Forges (Chimay); 17.04 ♂ Auvelais (Sambreville); 18.04 ♀ Court-Saint- Etienne (Court-Saint-Etienne); 20.04 ♀ Sars Longchamps (La Louvière); 20.04 ♀ Hondeng-Aimeries (La Louvière); 28.04 ♂ Esneux (Esneux); 29.04 ♀ Rendeux-bas (Rendeux); 29.04 ♂ Visé (Visé); ??.05 ♀ Gembloux (Gembloux); 07.05 ♂ Ligny (Sombreffe); 08.05 ♀ La Louvière (La Louvière); 11.05 ♀ Marcinelle (Charleroi); 25.05 ♀ Mazy (Gembloux); 28.05 ♀ Chimay (Chimay); 30.05 ♀ Ligny (Sombreffe); 10.06 ♀ Celles (Lez Tournai)(Celles); 15.06 ♂ Ceroux-Mousty (Ottignies-Louvain-la-Neuve); 16.06 ♀ Dottignies (Mouscron); 30.06 ad Jambes (Namur); 25.07 ♂ Jemeppe-sur-Sambre (Jemeppe-sur-Sambre); ??.08 ♀ Gembloux (Gembloux); 13.08 ♀ Gembloux (Gembloux); 21.08 ♀ Gembloux (Gembloux); 25.08 ♀ Héron (Héron); 26.08 ♂ Mariemburg (Couvin); 03.09 ♂ Bleret (Waremme); 13.10 ♂ Tongrinne (Sombreffe)

1985: 23.09 ♀ Falmignoul (Dinant); 27.09 ad Beuzet (Gembloux); 15.11 ad Martelange (Martelange);

1986: 05.05 ad Estinnes-au-Val (Estinnes); 30.05 ♀ Ceroux-Mousty (Ottignies-Louvain-la-Neuve); 02.07 ad Gembloux (Gembloux); 12.08 ad Ham-sur-Heure (Ham-sur-Heure-Nalinnes); 23.08 ad Saint-Gilles (Saint-Gilles); 24.08 ♀ Limal (Wavre); 25.08 ad Sauvenière (Gembloux);

1989: 05.05 ♂ Spy (Jemeppe-sur-Sambre); 05.11 ♀ Châtelet (Châtelet)

Chrysopa perla (LINNAEUS, 1758)

1983: 31.05 ♀ Beauvechain (Beauvechain); 10.06 ♂ Gembloux (Gembloux); 12.06 ♂ Dour (Dour); 12.06 ♂ Cerfontaine (Cerfontaine); 26.06 ♂ Awans (Awans); ??.07 ad Harmignies (Mons);

15.07 ♂ Molenbeek-Saint-Jean (Molenbeek-Saint-Jean); 21.07 ♂ Gembloux (Gembloux); 23.07 ♀ Ottignies (Louvain-la-Neuve)

1984: 15.04 ♂ Forville (Fernelmont); 21.04 ♂ Natoye (Hamois); 06.05 ♂ Florennes (Florennes); 15.05 ♂ Gembloux (Gembloux); 20.05 ♂ Woluwé-Saint-Lambert (Woluwé-Saint-Lambert); 26.05 ♀ Dilbeek (Dilbeek); 01.06 ♂ Elouges (Dour); 02.06 ♂ Kehlen?; 07.06 ♂ Mazy (Gembloux); 07.06 ♂ Gembloux (Gembloux); 09.06 ♂ Gembloux (Gembloux); 09.06 ♂ Verviers (Verviers); 10.06 ad Ivoz-Ramet (Flémalle); 10.06 ♂ Philippeville (Philippeville); 12.06 ♂ Jamioulx (Ham-sur-Heure-Nalinnes); 15.06 ♂ Seneffe (Seneffe); 15.06 ♂ Wavre (Wavre); 16.06 ♀ Tertre (Saint-Ghislain); 16.06 ♂ Seneffe (Seneffe); 17.06 ♀ Braine-l-Alleud (Braine-l-Alleud); 20.06 ♂ Gembloux (Gembloux); 23.06 ♀ Jupille-sur-Meuse (Liege); 26.06 ♀ Gembloux (Gembloux); 27.06 ♂ Gembloux (Gembloux); 29.06 ♂ Gembloux (Gembloux); 12.07 ♀ Jemeppe (Jemeppe-sur-Sambre); 21.07 ♀ Molenbeek-Saint-Jean (Molenbeek-Saint-Jean); 07.08 ♂ Gembloux (Gembloux); 10.08 ad Bernimont (Léglise); 10.08 ♀ Bernimont (Léglise); 30.08 ♂ Frisée (Hamois)

1986: 20.06 ad Haillot (Ohey); 05.07 ad Liège (Liège); 05.07 ♀ Bertogne (Bertogne); 07.07 ♂ Kain (Tournai); 18.07 ♂ Gembloux (Gembloux); 02.08 ad Namur (Namur)

1989: 10.07 ♀ Walhain-Saint-Paul (Walhain); 24.08 ad Gembloux (Gembloux)

Chrysopa pallens (RAMBUR, 1838)

1987: 12.07 ad Kain (Tournai)
1984: 16.06 ♀ Mazy (Gembloux)

Nineta flava (SCOPOLI, 1763)

1982: 13.08 ad Xhendelesse (Herve)
1984: 09.08 ♀ Houtain-Saint-Simèon (Oupeye)

Dichochrysa prasina (BURMEISTER, 1839)

1984: 22.08 ♀ Gembloux (Gembloux); 26.08 ♂ Silenrieux (Cerfontaine)

Dichochrysa flavifrons (BRAUER, 1850)

1984: 25.08 ♀ Angleur (Liège)

Chrysopa phyllochroma WESMAEL, 1841

1986: 10.07 ad Gottignies (Le Roeulx)

The 137 specimens of 7 species of the collection were caught during 7 years (1982–1987, 1989) in 102 localities of Belgium (mainly in the south of the country). *Chrysoperla carnea* and *Chrysopa perla* predominated amounting 59.1 and 35% of the individuals while the rest of species *Chrysopa pallens, Ch. phyllochroma, Nineta flava*, *Dichochrysa prasina* and *D. flavifrons* seemed to be quite sporadic (Table 1). However, according to the contradiction between the numerous collection sites and the extremely low number of individuals captured the collectors must have caught almost incidentally the lacewings.

Results of the collections at Gembloux

1652 individuals of 7 species were captured through 4 months in 1995 at the Experimental Area (Table 1). Also *Chrysoperla carnea* and *Chrysopa perla* were the dominant species but *Dichochrysa prasina* was relatively permanent and common, too. The other species occurrence and abundance were occasional.

587 specimens of 7 chrysopid species were captured in 1997. *Chrysoperla carnea* was absolutely dominant whereas *Dichochrysa prasina, Nineta flava* and *Cunctochrysa albolineata* occurred relatively often. *Dichochrysa flavifrons*, *Chrysopa perla* and *Nineta pallida* were found only singly (Table 1).

Altogether 2376 specimens of 10 lacewing species were collected and identified according to our findings during the last 18 years in Belgium (Table 2). *Chry-*

Table 1. List of lacewing adults of the pinned collection and those collected in 1995 and 1997 (Gembloux, Belgium) (% = percent of dominance values)

Species	Pinned collection		1995		1997	
	No.	%	No.	%	No.	%
Ch. carnea	81	59.1	1604	97.09	562	95.74
Ch. perla	48	35.0	24	1.45	1	0.17
D. prasina	2	1.5	16	0.97	10	1.70
N. flava	2	1.5	1	0.06	6	1.02
D. flavifrons	1	0.7	5	0.30	1	0.17
C. albolineata	–		1	0.06	6	1.02
Ch. pallens	2	1.5	–		–	
Ch. phyllochroma	1	0.7	–		–	
D. ventralis	–		1	0.06	–	
N. pallida	–		–		1	0.17
Total number of species	7		7		7	
Total number of individuals	137		1652		587	

Table 2. List of lacewing adults collected in 1982–1997 (Belgium)

Species	Occurrence (months)	No.	%
Ch. carnea	1–12	2247	94.57
Ch. perla	4,5,6,7,8	73	3.07
D. prasina	7,8,9	28	1.18
N. flava	7,8	9	0.38
D. flavifrons	7,8	7	0.29
C. albolineata	7,8	7	0.29
Ch. pallens	6,7	2	0.08
Ch. phyllochroma	7	1	0.04
D. ventralis	7	1	0.04
N. pallida	7	1	0.04
Total number of species		10	
Total number of individuals		2376	

soperla carnea was really ordinary and frequent everywhere as it was indicated previously (NAVÁS 1913). The former status of *Chrysopa perla*, common far and wide in Belgium (NAVÁS 1913), can be agreed, too. And that is the case also with *Dichochrysa prasina* that can be characterized as a common and generally wide-spread species. *Nineta flava, Chrysopa pallens* and *Dichochrysa flavifrons* were classified as quite common or generally wide-spread lacewings (NAVÁS 1913) but considering the afore said results, *Ch. pallens* seems to be rather rare and neither of the two other species could be designated frequent. The previous occurrence characteristics of *Chrysopa phyllochroma, Cunctochrysa albolineata* and *Dichochrysa ventralis* were rare or quite rare and that is right for the present situation. About *Nineta pallida* there was no data at all, *ergo* it seems to be new for the Belgian fauna. Almost all of the rare species, *N. flava, N. pallida, Ch. pallens, C. albolineata, D. ventralis* and *D. flavifrons* can be found in the neighbouring countries (the Netherlands, Luxembourg, France, Germany, Great Britain), except *N. pallida* missing in the Netherlands, Luxembourg and Great Britain (ASPÖCK *et al*. 1980). The finding of *N. pallida* is really probable and valid because this species has been found also in collections in Sweden and Denmark (POPOV 2000, pers. comm.).

The number of species (*Nothochrysa fulviceps, Nothochrysa capitata, Hypochrysa elegans, Nineta vittata, Chrysotropia ciliata, Chrysopa formosa, Chrysopa dorsalis, Chrysopa abbreviata*) that have not been detected since 1913 in Belgium is considerable, too. These species were verified in the neighbouring countries with the exception of *N. capitata* missing in both Luxembourg and France, *H.*

elegans lacking in Luxembourg and Great Britain and *Ch. formosa* missing in the Netherlands, Luxembourg and Great Britain (ASPÖCK *et al*. 1980). One of them (*Chrysotropia ciliata*) have been found at Gembloux, too. It is highly probable that the species living in the Netherlands can find favourable conditions, habitats also in Belgium, thus their missing in collections is only a consequence of the insufficient investigation.

Regarding the previously stressed lack of data on Belgian lacewings, also their monthly occurrence is presented in Table 2 as complementing information.

The sibling species of *Chrysoperla carnea* complex have been identified but their data were published elsewhere (BOZSIK 2000).

CONCLUSIONS

According to the cited references and the results of the present publication 18 chrysopid species have been verified in Belgium (*Nothochrysa fulviceps, N. capitata, Hypochrysa elegans, Nineta vittata, N. flava, N. pallida, Chrysotropia ciliata, Chrysopa pallens, Ch. abbreviata, Ch. phyllochroma, Dichochrysa flavifrons, D. prasina, D. ventralis, Chrysopa perla, Ch. formosa, Ch. dorsalis, Chrysoperla carnea, Cunctochrysa albolineata*). One species, *N. pallida* proved to be new for the Belgian fauna. Considering that the Belgian lacewing fauna has been understudied, the presented results could be seen only as the first attempts to change this poor situation.

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