

Checklist of the Belgian Neuroptera

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Abstract

Historically, Neuroptera received a lot of attention in Belgium by entomologists such as WESMAEL, DE SELYS-LONGCHAMPS, LAMEERE and NAVAS. However, since more than a century, no updated checklist has been published. Recently, only the family Chrysopidae has been studied, while the other families belonging to the Neuroptera hardly received any attention. Here, 56 species of Neuroptera are listed for the fauna of Belgium. Six species are reported here for the first time for Belgium: *Coniopteryx (Coniopteryx) borealis* Tjeder, 1930, *Coniopteryx (Coniopteryx) pygmaea* Enderlein, 1906, *Semidalis pseudouncinata* Meinander 1963 (Coniopterygidae), *Psectra diptera* (Burmeister, 1839), *Wesmaelius (Wesmaelius) quadrifasciatus* (Reuter, 1894) (Hemerobiidae) and *Libelloides coccajus* Denis & Schiffermüller, 1775 (Ascalaphidae). However, the latter one was not included in the checklist because it was not considered as an indigenous species as the only observation was either a vagrant or an imported specimen. *Megalomus hirtus* (Linnaeus, 1761) was misidentified and it is actually *Megalomus tortricoides* Rambur, 1842 (Hemerobiidae) that occurs in Belgium. The species complex *Chrysopa phyllochroma* Wesmael, 1841 and *Chrysopa commata* Kis & Üjhelyi, 1965 clearly consists of two species, however, it seems likely that for the description of both species, holotype material of the same species was used and a revision of both species is thus needed. Finally, some additional species are mentioned that might occur in Belgium, based on their occurrence in adjacent countries.

Keywords : *Chrysopa phyllochroma*, *Chrysopa commata*, *Coniopteryx borealis*, *Coniopteryx pygmaea*, *Libelloides coccajus*, *Megalomus tortricoides*, *Psectra diptera*, *Semidalis pseudouncinata*, *Wesmaelius quadrifasciatus*.

Samenvatting

Vroeger kregen Neuroptera veel aandacht in België van entomologen zoals WESMAEL, DE SELYS-LONGCHAMPS, LAMEERE en NAVAS. Sinds meer dan een eeuw werd echter al geen nieuwe soortenlijst meer opgesteld. Recent werden alleen de Chrysopidae bestudeerd, terwijl de andere Neuroptera families amper aandacht kregen. Hier worden 56 soorten Neuroptera gemeld voor de Belgische fauna. Zes soorten worden hier voor het eerst gemeld voor België: *Coniopteryx (Coniopteryx) borealis* Tjeder, 1930, *Coniopteryx (Coniopteryx) pygmaea* Enderlein, 1906, *Semidalis pseudouncinata* Meinander, 1963 (Coniopterygidae), *Psectra diptera* (Burmeister, 1839), *Wesmaelius (Wesmaelius) quadrifasciatus* (Reuter, 1894) (Hemerobiidae) en *Libelloides coccajus* Denis & Schiffermüller, 1775 (Ascalaphidae). De laatste werd echter niet in de soortenlijst opgenomen omdat de soort niet werd beschouwd als inheems omdat de enige observatie een zwerver of een geïmporteerd exemplaar was. De melding van *Megalomus hirtus* (Linnaeus, 1761) betrof een foute determinatie en het is eigenlijk *Megalomus tortricoides* Rambur, 1842 (Hemerobiidae) die voorkomt in België. Het soortencomplex *Chrysopa phyllochroma* Wesmael, 1841 en *Chrysopa commata* Kis & Üjhelyi, 1965 bestaat duidelijk uit twee soorten, maar het ziet er naar uit dat voor het beschrijven van beide soorten holotype materiaal van dezelfde soort werd gebruikt en een revisie dringt zich op. Tenslotte worden enkele soorten genoemd die, gebaseerd op hun verspreiding in de omliggende landen, mogelijks zouden kunnen voorkomen in België.

Résumé

Historiquement, les Neuroptères ont été très étudiés en Belgique par des entomologistes comme WESMAEL, DE SELYS-LONGCHAMPS, LAMEERE et NAVAS. Cependant depuis plus d'un siècle, aucune liste mise à jour n'a été publiée. Récemment, seuls les Chrysopidae ont été étudiés alors que les autres familles de Neuroptères ont très peu attiré l'attention. Une liste de 56 espèces est présentée ici dont six espèces sont signalées pour la première fois de Belgique : *Coniopteryx (Coniopteryx) borealis* Tjeder, 1930, *Coniopteryx (Coniopteryx) pygmaea* Enderlein 1906, *Semidalis pseudouncinata* Meinander, 1963 (Coniopterygidae), *Psectra diptera* (Burmeister, 1839), *Wesmaelius (Wesmaelius) quadrifasciatus* (Reuter, 1894) (Hemerobiidae) et *Libelloides coccajus* Denis & Schiffermüller, 1775 (Ascalaphidae). Cette dernière n'était pas incluse dans la liste des espèces, elle n'était pas considérée comme indigène car la seule observation était celle d'un individu erratique ou issu d'une importation. Les individus identifiés comme *Megalomus hirtus* (Linnaeus, 1761) étaient en réalité des *Megalomus tortricoides* Rambur, 1842 (Hemerobiidae). Le complexe d'espèces *Chrysopa phyllochroma* Wesmael, 1841 et *Chrysopa commata* Kis & Üjhelyi, 1965 se compose clairement de deux espèces. Il est probable que lors de la description de ces espèces, le même matériel typique ait été utilisé, une révision est donc nécessaire. Quelques espèces qui pourraient être présentes en Belgique sur base de leur répartition dans les régions voisines sont également mentionnées.

Introduction

WESMAEL (1841) was the first who studied Neuroptera in Belgium and he already listed 21 species. Later, DE SELYS-LONGCHAMPS (1888) mentioned 39 species, but surprisingly, LAMEERE (1900) only retained 12 species in his manual of the Belgian fauna. Finally, NAVAS (1912) listed 42 species. Since that time, several additional Chrysopidae have been reported (BOZSIK *et al.*, 2000a,b, 2003; SAN MARTIN, 2005; SAN MARTIN *et al.*, 2006; BOZSIK, 2010) and LESTAGE (1924) observed one additional species of Hemerobiidae. In the present study, an updated checklist is presented. One previously reported species was misidentified and in addition, six species are reported here for the first time for Belgium.

Materials and methods

During the present study, all the available material from the Royal Belgian Institute of Natural Sciences (KBIN-IRSNB), the University Faculty of Agronomic Sciences in Gembloux (FSAG), the University of Mons (UMons) and the University of Liège (ULG) was identified. In addition, Neuroptera were sampled during several field trips for the last four years.

The Belgian Neuroptera can all be identified with the books of ASPÖCK *et al.* (1980a,b), which contain all the species occurring in Europe. The much cheaper identification key of PLANT (1997) and the book with colour plates of WACHMANN & SAURE (1997) unfortunately do not contain all species occurring in Belgium. Recently, a French key for the Belgian Chrysopidae was developed (SAN MARTIN, 2005), which was later translated in Dutch (SAN MARTIN *et al.*, 2006). For the other Neuroptera families, there is unfortunately not yet any alternative to the expensive European guide (ASPÖCK *et al.*, 1980a,b).

Results

In total, 56 indigenous species of Neuroptera have been found in Belgium (Table 1). For each family, changes in the Belgian fauna are discussed below.

Table 1. Checklist of the Belgian Neuroptera.

Family Chrysopidae
1. <i>Chrysopa abbreviata</i> Curtis 1834
2. <i>Chrysopa commata</i> Kis & Újhelyi 1965
3. <i>Chrysopa dorsalis</i> Burmeister 1839
4. <i>Chrysopa formosa</i> Brauer 1850
5. <i>Chrysopa nigricostata</i> Brauer 1850
6. <i>Chrysopa pallens</i> Rambur 1838
7. <i>Chrysopa perla</i> (Linnaeus 1758)
8. <i>Chrysopa phyllochroma</i> Wesmael 1841
9. <i>Chrysoperla carnea</i> (Stephens 1836) <i>sensu lato</i>
10. <i>Chrysotropia ciliata</i> (Wesmael 1841)
11. <i>Cunctochrysa albolineata</i> (Killington 1935)
12. <i>Hypochrysa elegans</i> (Burgmeister 1839)
13. <i>Nineta flava</i> (Scopoli 1763)
14. <i>Nineta principiae</i> Monserrat 1980
15. <i>Nineta pallida</i> (Schneider 1846)
16. <i>Nineta vittata</i> (Wesmael 1841)
17. <i>Nothochrysa capitata</i> (Fabricius 1793)
18. <i>Nothochrysa fulviceps</i> (Stephens 1836)
19. <i>Peyerimhoffina gracilis</i> (Schneider 1851)
20. <i>Pseudomallada abdominalis</i> (Brauer 1856)
21. <i>Pseudomallada flavifrons</i> (Brauer 1850)
22. <i>Pseudomallada prasinus</i> (Burmeister 1839)
23. <i>Pseudomallada ventralis</i> (Curtis 1834)
Family Coniopterygidae
24. <i>Coniopteryx (Coniopteryx) borealis</i> Tjeder 1930
25. <i>Coniopteryx (Coniopteryx) pygmaea</i> Enderlein 1906
26. <i>Coniopteryx (Coniopteryx) tineiformis</i> Curtis 1834
27. <i>Conwentzia pineticola</i> Enderlein 1905
28. <i>Conwentzia psociformis</i> (Curtis 1834)
29. <i>Semidalis aleyrodiformis</i> Stephens 1836
30. <i>Semidalis pseudouncinata</i> Meinander 1963
Family Hemerobiidae
31. <i>Drepanopteryx phalaenoides</i> (Linnaeus 1758)
32. <i>Hemerobius (Brauerobius) marginatus</i> Stephens 1836
33. <i>Hemerobius (Hemerobius) atrifrons</i> McLachlan 1868
34. <i>Hemerobius (Hemerobius) humulinus</i> Linnaeus 1758
35. <i>Hemerobius (Hemerobius) lutescens</i> Fabricius 1793
36. <i>Hemerobius (Hemerobius) micans</i> Olivier 1792
37. <i>Hemerobius (Hemerobius) nitidulus</i> Fabricius 1777
38. <i>Hemerobius (Hemerobius) pini</i> Stephens 1836
39. <i>Hemerobius (Hemerobius) stigma</i> Stephens 1836
40. <i>Megalomus torricoides</i> Rambur 1842
41. <i>Micromus angulatus</i> (Stephens 1836)
42. <i>Micromus paganus</i> (Linnaeus 1767)
43. <i>Micromus variegatus</i> (Fabricius 1793)
44. <i>Psectra diptera</i> (Burmeister 1839)
45. <i>Sympherobius (Niremberge) fuscescens</i> (Wallengren 1863)
46. <i>Sympherobius (Sympherobius) elegans</i> (Stephens 1836)
47. <i>Sympherobius (Sympherobius) pygmaeus</i> (Rambur 1842)
48. <i>Wesmaelius (Kimminsia) nervosus</i> (Fabricius 1793)
49. <i>Wesmaelius (Kimminsia) subnebulosus</i> (Stephens 1836)
50. <i>Wesmaelius (Wesmaelius) concinnus</i> (Stephens 1836)
51. <i>Wesmaelius (Wesmaelius) quadrifasciatus</i> (Reuter 1894)
Family Myrmeleontidae
52. <i>Euroleon nostras</i> (Geoffroy in Fourcroy 1785)
53. <i>Myrmeleon formicarius</i> Linnaeus 1767
Family Osmylidae
54. <i>Osmylus fulvicephalus</i> (Scopoli 1763)
Family Sisyridae
55. <i>Sisyra nigra</i> (Retzius 1783)
56. <i>Sisyra terminalis</i> Curtis 1854



Fig. 1. Habitus of *Libelloides coccajus* Denis & Schiffermüller, 1775 (Ascalaphidae) (photograph by Tim ADRIAENS).

Family Ascapphilidae

One specimen of *Libelloides coccajus* Denis & Schiffermüller, 1775 (Fig. 1) was photographed in Lier in July 2008 (NATUUR.FORUM VLAANDEREN, 2013). However, this individual was probably either a vagrant or it was imported and to our knowledge, no reproductive population is known in Belgium. In any case, this species and also *Libelloides longicornis* (Scopoli, 1763) might be able to colonise Belgium in the near future. Populations of both species are present on dry grasslands in Northern France (Lorraine, Champagne-Ardenne), very close to the Belgian border (JACQUEMIN & SARDET, 2003; LECONTE, 2009).

Family Chrysopidae

Recently, Chrysopidae were relatively well studied and several species could be added to the Belgian fauna: *Nineta pallida* (Schneider, 1846) (BOZSIK *et al.*, 2000a), *Peyerimhoffina gracilis* (Schneider, 1851) (BOZSIK *et al.*, 2000b), *Chrysopa commata* Kis & Újhelyi 1965, *Chrysopa nigricostata* Brauer 1850, *Pseudomallada abdominalis* (Brauer, 1856) (SAN MARTIN, 2005) and *Nineta principiae* Monserrat, 1980 (BOZSIK, 2010).

It should also be noted that what is listed here as *Chrysoperla carnea* (Stephens, 1836) *sensu lato*, is actually a species complex, however, there is not yet a consensus about the exact classification.

BOZSIK *et al.* (2003) recognised three different species occurring in Belgium: *C. lucasina* (Lacroix, 1912), *C. pallida* Henry, Brooks, Duelli & Johnson, 2002 (= Cc2 or slow motorboat) and *C. carnea* (Stephens, 1836) (=Cc4 or motorboat or *C. kolthoffi*). SAN MARTIN *et al.* (2006) also reported *Chrysoperla mediterranea* (Hölzel, 1972) from Belgium, however, Steve BROOKS re-identified this material and it turned out that it actually was *Peyerimhoffina gracilis* (Schneider, 1851).

There is also some doubt about the species *Chrysopa phyllochroma* Wesmael, 1841 and *Chrysopa commata* Kis & Újhelyi, 1965. Although this species complex clearly contains two distinct species

(i.e. based on the genitalia), which both occur in Belgium, the distinction of these two species based on external characters seems uncertain. According to the original description of KIS & ÚJHELYI (1965) and several other identification keys frequently used in Europe (PLANT, 1997; KIS *et al.*, 1970), a reliable distinction between both species seems to be the presence (*C. commata*) or absence (*C. phyllochroma*) of black thoracic sutures. However, these black thoracic sutures are also present on the holotype individual that was used by WESMAEL to describe *C. phyllochroma*. These black thoracic sutures can therefore not be used as a reliable distinctive character. Another explanation would be that the black sutures are a good distinctive character but that both holotypes of *C. phyllochroma* and *C. commata* are in fact of the same species. Indeed, the genitalia of the *C. phyllochroma* holotype have never been examined. The presence of a black spot on the scapus, another external character frequently used, is probably not a good characteristic due to geographical variability and this spot can lack in both species (TRÖGER, 2003). A revision of these two species is therefore needed and it is advised that till then, it is always indicated which external characters have been used for identification and if possible, the genitalia should be examined.

Family Coniopterygidae

Conwentzia pineticola Enderlein, 1905 and *Semidalis aleyrodiformis* Stephens, 1836 were the only two species that could not be verified during the present study and for which only literature data were available. However, both species are known from the neighbouring countries and there is no reason to doubt their occurrence in Belgium. During the present study, *Coniopteryx* (*Coniopteryx*) *borealis* Tjeder, 1930 was observed for the first time in Belgium. The species was found on the chalk grassland Fondry des Chiens in Nismes on 4.IX.2010 and in the wetland area Bourgoyen in Mariakerke on 12.VI.2011. Another addition to the Belgium fauna is *Coniopteryx* (*Coniopteryx*) *pygmaea* Enderlein, 1906, which was found on a chalk grassland in Belvaux on 31.VII.2011. Finely, also *Semidalis pseudouncinata* Meinander 1963 (Fig. 2) could be added to the Belgian fauna. One male of this species was observed on *Cupressus* along the river Lesse in Chanly on 20.V.2012. Previously, this species was probably also found on *Juniperus* on the chalk grasslands Fondry des Chiens and Montagne aux Buis in Nismes on 4.IX.2010 and on other chalk grasslands in Belvaux and Han-sur-Lesse on 31.VII.2011. As only females were found on the latter locations, their identification could not be confirmed with certainty. However, as all these observations were done on *Juniperus*, it is likely that it concerns *S. pseudouncinata* rather than *S. aleyrodiformis*, which is usually associated with broadleaved trees. For the identification of Coniopterygidae, it is in most cases necessary to investigate male genitalia.



Fig. 2. Habitus of *Semidalis cf. pseudouncinata* Meinander 1963 (Coniopterygidae) (photograph by Koen LOCK).

Family Hemerobiidae

Since NAVAS (1912) published his checklist, only one additional species has been discovered in Belgium: LESTAGE (1924) reported *Symphorobius* (*Symphorobius*) *pygmaeus* (Rambur, 1842) from Halloy and Hastière.

All material that had been identified as *Megalomus hirtus* (Linnaeus, 1761) turned out to be *Megalomus tortricoides* Rambur, 1842. The tip of the abdomen of males of the latter species is characterised by a dorsal hump on the ectoproct (Fig. 3).



Fig. 3. Lateral view of the abdominal tip of a male *Megalomus tortricoides* Rambur 1842 (Hemerobiidae), with indication of the hump on the ectoproct (photograph by Koen LOCK).

However, females can hardly be distinguished. So far, *M. tortricoides* was only observed in the nineteenth century: in Brussels by WESMAEL and in Freyr by DE SELYS-LONGCHAMPS.

While inspecting the collection of the Royal Belgian Institute of Natural Sciences, *Psectra diptera* (Burmeister, 1839) was discovered. The specimen was collected in Assenede on 7.IX.1943 by GOETGHEBUER, however, the species was wrongly identified as *Hemerobius (Hemerobius) micans* Olivier 1792. *P. diptera* can be recognised by the absence of a recurrent humeral vein in the fore wing and there are only two branches to the radial vein (Fig. 4). Recently, Jean-Yves BAUGNÉE observed the species in Treignes (BAUGNÉE, personal communication) and the species was also found in the wetland area Terlamen in Bolderberg on 3.VII.2009.

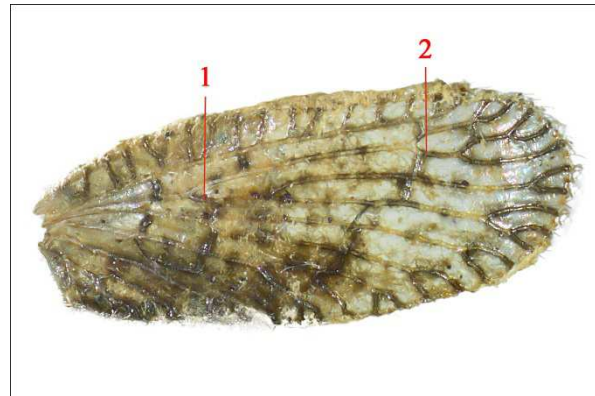


Fig. 4. Right fore wing of *Psectra diptera* (Burmeister 1839) (Hemerobiidae), with indication of the two branches to the radial vein (photograph by Koen LOCK).

Some of the specimens identified as *Wesmaelius (Wesmaelius) concinnus* (Stephens, 1836) turned out to be *Wesmaelius (Wesmaelius) quadrifasciatus* (Reuter, 1894) (Fig. 5). The latter species can be recognised by a dark brown thorax with a pale dorsal stripe, whereas *W. concinnus* has a unicolorous pale thorax. In addition, the fore wings of *W. quadrifasciatus* bear numerous dark spots, whereas only a few dark spots are present in the fore wings of *W. concinnus*. The longitudinal veins of the fore wing of *W. quadrifasciatus* bear dark streaks, the length of most of these streaks being far in excess of twice the width of the vein on which they are situated. In *W. concinnus*, the longitudinal veins in the fore wing bear dark spots, the length of these spots being only around 1.5 to 2 times the width of the vein on which they are situated. *W. quadrifasciatus* has so far only been captured in the nineteenth century by DE SELYS-LONGCHAMPS in Halloy and Esneux.



Fig. 5. Habitus of *Wesmaelius (Wesmaelius) quadrifasciatus* (Reuter 1894) (Hemerobiidae) (photograph by Koen LOCK).

Family Myrmeleontidae

Euroleon nostras (Geoffroy in Fourcroy 1785) and *Myrmeleon formicarius* Linnaeus, 1767 are both regularly encountered in Belgium. Also the much smaller *Myrmeleon inconspicuus* Rambur, 1842 has been reported from Belgium by LESTAGE (1926) and NAVAS (1932), however, these authors had not seen Belgian material of this species themselves and the occurrence of the species in Belgium could not be confirmed. This species was therefore omitted from the Belgian checklist.

Family Osmylidae

Only *Osmylus fulvicephalus* (Scopoli, 1763) occurs in Belgium. This species has semi-aquatic larvae that live in or near streams with a good water quality.

Family Sisyridae

Only *Sisyra nigra* (Retzius, 1783) and *Sisyra terminalis* Curtis, 1854 have already been reported in Belgium. The aquatic larvae of Sisyridae are associated with freshwater sponges and reside within the tissue of the sponge.

Discussion

The observation of the six species that are reported here for the first time for Belgium is not unexpected, since they already had been reported in the neighbouring countries. *L. coccajus* had already been observed in Rheinland-Pfalz (SAURE, 2001) and in the Lorraine and the Champagne-Ardenne in Northern France (JACQUEMIN & SARDET, 2003; LECONTE, 2009). *C. borealis* had already been observed in the Netherlands (KLEUKERS, 2013), Luxembourg (CARRIÈRES, 2001), Rheinland-Pfalz and Nordrhein-Westfalen (SAURE, 2001), while *C. pygmaea* had been found in the Netherlands (KLEUKERS, 2013), Rheinland-Pfalz and Nordrhein-Westfalen (SAURE, 2001). *S. pseudouncinata* had been observed in Nordrhein-Westfalen (SAURE, 2001). *P. diptera* was already known from the Netherlands (KLEUKERS, 2013), Rheinland-Pfalz and Nordrhein-Westfalen (SAURE, 2001). *W. quadrifasciatus* had also been recorded in the Netherlands (KLEUKERS, 2013) and Nordrhein-Westfalen (SAURE, 2001). In Rheinland-Pfalz and Nordrhein-Westfalen, *M. tortricoides* is also the only species of this genus that has been observed (SAURE, 2001).

In the Netherlands, several species are reported that have not yet been found in Belgium: *Cunctochrysa bellifontensis* Leraut, 1988 (Chrysopidae), *Coniopteryx (Metaconiopteryx) esbenpeterseni* Tjeder, 1930, *Coniopteryx (Metaconiopteryx) tjederi* Kimmins, 1934, *Helicoconis (Helicoconis) lutea* (Wellengren, 1871), *Parasemidalis fuscipennis* (Reuter, 1894) (Coniopterygidae), *Drepanepteryx algida* (Erichson in Middendorff, 1851), *Hemerobius (Hemerobius) fenestratus* Tjeder, 1932, *Sympherobius (Niremberge) klapaleki* Zelený, 1963, *Sympherobius (Niremberge) pellucidus* (Walker, 1853), *Wesmaelius (Kimminsia) balticus* (Tjeder, 1931), *Wesmaelius (Kimminsia) mortoni* (McLachlan, 1899) (Hemerobiidae), *Sisyra dalii* McLachlan, 1866 and *Sisyra jutlandica* Esben-Petersen, 1915 (Sisyridae) (HOGENES, personal communication). From Luxembourg, 38 species have been reported (CARRIÈRES, 2001) of which *Aleuropteryx loewii* Klapálek, 1894 (Coniopterygidae) and *Sympherobius (Sympherobius) fallax* Navas, 1908 (Hemerobiidae) have not yet been observed in Belgium. In the German federal states bordering Belgium, Rheinland-Pfalz and Nordrhein-Westfalen, respectively 55 and 61 species have been found (SAURE, 2001). Species that occur in those states and that might thus be expected in Belgium are: *Chrysopa viridana* Schneider, 1845, *Chrysopa walkeri* McLachlan, 1893 (Chrysopidae), *Nineta inpunctata* (Reuter, 1894) (Chrysopidae), *Coniopteryx (Metaconiopteryx) esbenpeterseni* Tjeder, 1930, *Coniopteryx (Holoconiopteryx) haematica* McLachlan, 1868, *Coniopteryx (Metaconiopteryx) lentiae* H. Aspöck & U. Aspöck, 1964, *Parasemidalis fuscipennis* (Reuter, 1894) (Coniopterygidae), *Drepanepteryx algida* (Erichson in Middendorff, 1851), *Hemerobius (Hemerobius) fenestratus* Tjeder, 1932, *Sympherobius (Niremberge) klapaleki* Zelený, 1963, *Sympherobius (Niremberge) pellucidus* (Walker, 1853), *Wesmaelius (Kimminsia) mortoni* (McLachlan, 1899) (Hemerobiidae), *Dendroleon pantherinus* (Fabricius, 1787), *Distoleon tetragrammicus* (Fabricius, 1798), *Myrmeleon bore* (Tjeder, 1941) (Myrmeleontidae) and *Sisyra dalii* McLachlan, 1866 (Sisyridae). It can be concluded that, although already 56 species of Neuroptera have been reported in Belgium, there are still a lot of additional species that might be expected.

Acknowledgements

We would like to thank the Royal Belgian Institute of Natural Sciences, Gembloux Agricultural University, the University of Mons and the University of Liège for the opportunity to study their collections. For the help during the study of the collections, we are grateful to Jérôme CONSTANT and Patrick GROOTAERT (Royal Belgian Institute of Natural Sciences), Jeannine BORTELS (Gembloux Agricultural University), Laurent CRÉPIN (University of Mons) and Pascal LAYS (University of Liège). We would like to thank Willem HOGENES (Naturalis) for proofreading, Arp KRUIHOF for discussions about the status of *C. phyllochroma* and Steve BROOKS, Christiane FASSOTTE and Colin PLANT for information about *C. mediterranea*.

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