

The sawfly *Arge dimidiata* in Belgium and the Netherlands (Hymenoptera: Argidae)

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Abstract

In this article we present a summary of historical and recent observations of the sawfly *Arge dimidiata* in Belgium and the Netherlands. Although the findings are scattered, this species can still be found at low density, mainly in large forest areas with birches. Apparently, it has two generations per year. Because of its similarity with *Arge melanochra* an overview is provided of the characteristics of both species.

Keywords: Hymenoptera, Symphyta, Argidae, *Arge dimidiata*, Belgium, the Netherlands

Samenvatting

In dit artikel stellen we een overzicht voor van de historische en recente waarnemingen van de bladwesp *Arge dimidiata* in België en Nederland. Hieruit blijkt dat deze soort nog steeds verspreid wordt waargenomen, vooral in grote bosgebieden met berken. Er zijn blijkbaar twee generaties aanwezig. Aangezien de adulten kunnen verward worden met de gelijkende soort *Arge melanochra*, geven we een overzicht van de belangrijkste kenmerken van beide soorten.

Résumé

Nous présentons dans cet article les observations historiques et récentes du symphyte *Arge dimidiata* en Belgique et aux Pays-Bas. Apparemment, cette espèce est toujours présente, surtout dans de grandes zones forestières avec des bouleaux. Il y a deux générations par an. Parce qu'il est possible de confondre les adultes avec ceux de l'espèce très similaire *Arge melanochra*, nous proposons un aperçu des caractéristiques morphologiques les plus importantes pour différencier ces deux espèces.

Introduction

Sawflies (Hymenoptera: Symphyta) are a heterogeneous group of Hymenopterans, which lack the 'wasp waist' and have a broad junction between the thorax and abdomen. Until now, 485 species have been reported from Belgium (LIBERT & MAGIS, 2016) and 525 species from the Netherlands (BLOMMERS, 2009). They belong to several families, principally the Tenthredinidae. In this study we are focusing on the Argidae, whereof 20 species have been reported for Belgium (LIBERT & MAGIS, 2016) and 19 species in the Netherlands (personal communication Ad Mol). This family received recently attention by the discovery of the invasive species *Aproceros leucopoda* Takeuchi, 1939 in Belgium (BOEVÉ, 2013) and the Netherlands (MOL & VONK, 2015). Argidae are characterised by a three segmented antenna, although the third segment may be bifid. Several species are frequently encountered like *Arge cyanocrocea* (Forster, 1771) and *Arge pagana* (Panzer, 1798), but some members of the genus *Arge* are considered as uncommon species such as *Arge dimidiata* (Fallén, 1808) and *Arge metallica* (Klug, 1934). The sawfly *A. dimidiata* (Fig. 1) occurs in many European countries, but is considered as a rare species. This contrasts with its widespread host plant, silver birch (*Betula pendula*) (LISTON, 1995). Since a recent study reported *A. dimidiata* as extinct in Belgium (MAGIS, 2015), we searched in several collections and citizen science databases for the past and possibly recent occurrence and distribution of this species in Belgium and the Netherlands.



Fig. 1. Adult of *Arge dimidiata* (Fallén, 1808) from Holten, The Netherlands (leg. J. Wessels, 01.VI.2015).

Material and methods

The members of the genus *Arge* from Belgium and the Netherlands can be identified using the key of Burggraaf-van Nierop & Achterberg (BURGGRAAF-VAN NIEROP & ACHTERBERG, 1990). We checked the collection of the Royal Belgian Institute of Natural Sciences (RBINS) and the European Insect Survey (EIS) database of the Netherlands. This database comprises the general sawfly collection data of Dutch museums, in addition to the private collections of Leo Blommers, Ad W. M. Mol and Bob van Aartsen. Further, the photographic databases of Atlas Hymenoptera, waarnemingen.be, waarneming.nl were screened for observations of *A. dimidiata* (last visited on 05 February 2018). These observations were plotted using the software Klasse 2.0.54 (published by Jeroen Fokker and Oscar Vorst) on a 10x10 km scale.

Acronyms used for the collections:

FSAGbx: Gembloux Agro-Bio Tech, Entomologie fonctionnelle et évolutive, Gembloux, Belgium

NMB: Natuurmuseum Brabant, Tilburg, the Netherlands

NMF: Natuurmuseum Fryslân, Leeuwarden, the Netherlands

NMN: Natuurmuseum Nijmegen, Nijmegen, the Netherlands

HZL: Het Zeeuwse Landschap, Wilhelminadorp, the Netherlands

RBINS: Royal Belgian Institute of Natural Sciences, Brussel, Belgium

RMNH: Rijksmuseum van Natuurlijke Historie, now called Naturalis Biodiversity Center, Leiden, The Netherlands

Results

The Netherlands:

Drenthe: Coevorden, 7.VI.2013, 1♀, leg. Jan de Gooijer; Dwingelo, 3.VI.1990, 1♀, leg. A.P. Teunissen, col. A.W.M. Mol; Klazienaveen, 22.V.2002, 1♂ leg. B. van Aartsen, col. A.W.M. Mol; Nieuwlande, 30.VIII.2015, 1♀ leg. Jan de Gooijer; Norg, 13.VI.1978, 1♀, leg. B. van Aartsen, col. B. van Aartsen; Schipborg, 27.V.2005, 1♀, leg. C.J. Zwakhals, col. L. Blommers; Weerwille, 2.VI.2010, 1♀, leg. J. Essink.

Fryslân: Makkinga, 30.V.1982, 1♂, leg. G. Stobbe, col. NMF.

Gelderland: Apeldoorn, unknown number and stadium, OUDEMANS (1894); Apeldoorn, 24.VII.2012, 1♀, leg. J.A.C. Clark; Barneveld, 17.IX.2012, 1 larva, leg. E. Bloemers; Nijmegen, 22.V.2015, 1♀, leg. E. van Dijk; Ede, 14.VII.2015, 1 adult, leg. M. de Haas; Montferland, 11.VIII.2007, 1 larva, leg. L. Blommers, col. L. Blommers; Nijmegen, 9.VI.1987, leg. R. Kleukers, col. NMN.

Limburg: Epen, 2.VI.1991, 1♂, leg. L. Blommers, col. L. Blommers; Meerssen, 1900, leg. unknown, col. RMNH; Mook en Middelaar, 17.V.2012, 1♀, leg. H. Alberts; Bergen, 10.VIII.2012, 1♀, leg. P. Smeets; Leudal, 29.VII.2017, 1♂, leg. J. Slaats, Leudal, 02.VIII.2017, 1♀, leg. J. Slaats.

Noord Brabant: Breda, 14.VIII.2012, 1♀, leg. P. Rijnen; Liempde, 6.VIII.2010, 1♀, leg. A.W.M. Mol & C.B. Cramer, col. A.W.M. Mol; Moergestel, 25.VI.1986, 1♀, leg. A.W.M. Mol, col. A.W.M. Mol; Moergestel, 24.VII.1988, 1♀, leg. T.M.J. Peeters, col. NMB; Strijbeek, 26.IX.2015, 1 larva, leg. K. Nilsen; Strijbeek, 26.IX.2015, 2 larvae, leg. R. van Middelkoop; Tilburg, 20.V.1998, 1♂, leg. Insectenwerkgroep KNNV Tilburg, col. A.W.M. Mol; Tilburg, 6.VI.2013, 1♂, leg. H. Spijkers, col. A.W.M. Mol; Tilburg, 2.VIII.1940, 1♀, leg. A. Adriaanse, col. NMB; Udenhout, 30.VI.1991, 1♀, leg. T.M.J. Peeters, col. A.W.M. Mol; Hilversum, 8.VI.1946, 1♀, leg. unknown, col. RMNH.; Sint-Michielsgestel, 05.VIII.2016, 1 larva, leg. A.W.M. Mol & C.B. Cramer (♀ emerged on 13.VI.2017); Strabrecht, 29.VIII.2012, 1 larva, leg. R. Kastelijn. Woensdrecht, 24.VIII.2016, 1♀, leg. H. Nouwens; Gilze en Rijen, 03.IX.2016, 1 larva, leg. P. Plasmeijer; Boxtel, 24.V.2017, 1♂, leg. and col. A.W.M. Mol; Valkenswaard, Plateaux, 26.VII.2017, 2♂, leg. A.W.M. Mol & C.B. Cramer, col. A.W.M. Mol.

Overijssel: Eerde, 31.V.1997, leg. B. van Aartsen, col. HZL; Holten, 01.VI.2015, 1♂, leg. J. Wessels; Twenterand, 03.VII.2016, 1 larva, leg. H. Exterkate & G. van de Maat; Wierden, 05.VII.2016, 1 larva, leg. J. Ligtenberg.

Utrecht: Leersum, 20.VI.1936, 1♀, leg. ?, col. RMNH, Rhenen, 29.V.2004, 1♀, leg. L. Blommers, col. L. Blommers; Veenendaal, 13.VI.2013, 1♀, leg. J. Bouwmans; Zeist, 18.V.2015, 1♀, leg. H. Jansen; Rhenen, 26.VIII.2016, 1♀, leg. J. Bouwmans.

Belgium:

Antwerpen: Balen, 7.X.2012, 1 larva, leg. C. Van Steenwinkel; Balen, 21.VIII.2012, 1 larva, leg. C. Van Steenwinkel; Mol, 30.VIII.2014, 2 L, R. van Middelkoop; Mol, 31.VIII.2014, 1 L, leg. P. & M. Wouters; Mol, 31.VIII.2014, 1 larva, leg. C. Van Steenwinkel; Wortel, 13.VII.2014, 1♀, leg. P. & M. Wouters; Morsel, 16.VIII.2015, 1♀, leg. D. Verstraeten; Veerle, 27.VI.2017, 1 larva, leg. C. Van Steenwinkel; Ravels, 1.VIII.2017, 1♀, leg. and col. G. Loos.

Liège: Herstal, 22.VIII.2010, 1 larva, leg. J. Y. Baugnée.

Luxembourg: Buzenol, 30.V.1931, leg. unknown, col. Maréchal (FSAGbx) (Belg. nov. Sp. CRÈVECOEUR & MARÉCHAL (1938)); Tellin, 26.V.1945, leg. A. Fouassin, col. Maréchal (FSAGbx), Ucimont, 17.VI.1896, 1♀, leg. P. De Moffart, col. RBINS, WOLF (1968); Ucimont, 15.VI.1897, 1♀, leg. P. De Moffart, col. RBINS, WOLF (1968); Ucimont, 24.VI.1897, 1♀, leg. P. De Moffart, col. RBINS, WOLF (1968). Namur: Hastière-par-delà, 23.VI.1985, 2♀, leg. A.W.M. Mol, col. A.W.M. Mol.

Oost Vlaanderen: Zaffelare, 14.VIII.2015, 1♀, leg. B. Lutin-Smit.

Vlaams-Brabant: Grimbergen, 25.V.2014, 1♀, leg. F. Coulier.

West Vlaanderen: Zillebeke, 14.VI.2012, 1♂, leg. M. Valdeuza.

Limburg: Overpelt, 17.VIII.2017, 1 larva, leg. G. Van Hertum; Lummen, 22.VIII.2017, 1 larva, leg. C. Van Steenwinkel.

During the examination of the RBINS collection we did find seven adult females of *A. dimidiata* labelled as 'Botassard, 4-vi-(18)97, det P. de Moffarts, rév Ed Dubois'. Although the number and the date don't correspond with the citations of F. Wolf, we assume that it concerns the same specimens. Moreover, two adults were found without information about their date and location. One specimen was labelled as 'col. Wesmael, det. Wesmael' and the other lacked all information but was misidentified as *A. melanochra*.

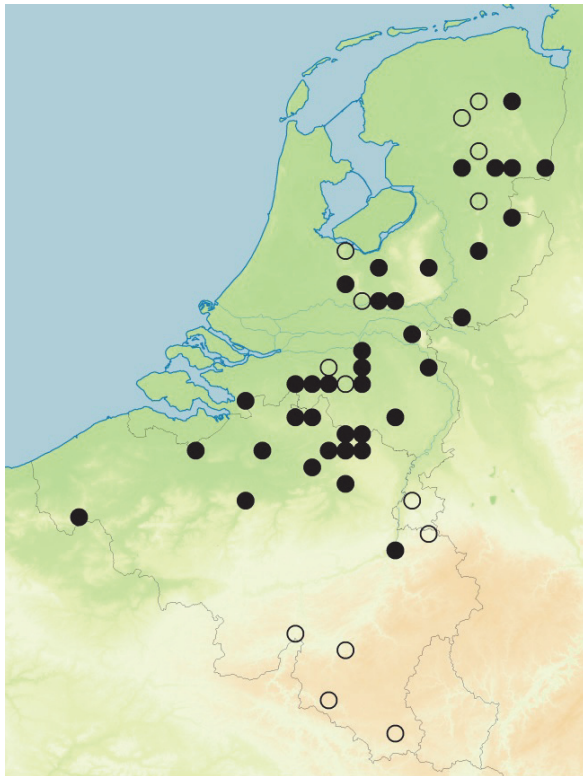


Fig. 2. Distribution map of the yet known observations of *Arge dimidiata*. Observations before 2000 are shown by a circle, observations after 2000 are shown by a black dot.

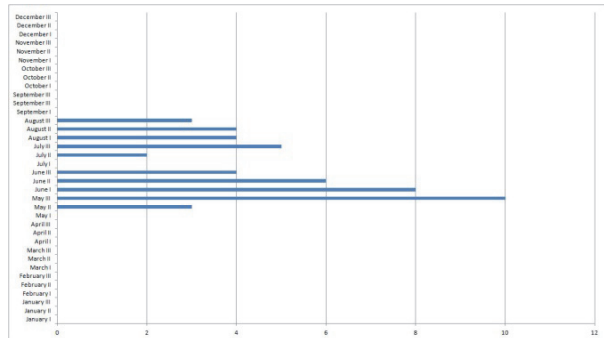


Fig. 3. Diagram of the flight period of the known observations of *Arge dimidiata* adults.



Fig. 4. Larva of *Arge dimidiata* from Overpelt, Belgium (leg. G. Van Hertum, 22.VIII.2017).

Discussion

As a result of our research we found several historical records of *A. dimidiata* in Belgium and the Netherlands, but also multiple recent records. This includes adults as well as larvae, thus we can state that this species is not extinct in Belgium and can be still encountered. Notably, these observations are scattered, a distribution map is presented in Fig. 2. The host plants of this species are birches (*Betula pendula* and *Betula pubescens*), which are very common trees in Belgium and the Netherlands. The data suggest that *A. dimidiata* can be found in large areas with birches and is lacking in parts with only scattered birch trees. Therefore, *A. dimidiata* might be a vulnerable species.

The observation dates of the *A. dimidiata* adults from both Belgium and the Netherlands suggest the presence of two generations per year (Fig. 3). The first generation can be found between 17 May and 30 June with a peak around the end of May and the beginning of June. After a gap of two weeks the second generation starts at 13 June until 30 August without a clear peak. Notably, all larvae except one are observed between 5 August and 7 October which is linked with the second half of the second generation.

The larvae of *A. dimidiata* can be easily identified: its body is green with dark green spots and fringed yellow with lobes; the head has a brown upside down Y-shape (Fig. 4). But due to the similarity between the adults of *A. dimidiata* and those of *A. melanochra*, we compiled a list of morphological characteristics, which can help to identify them from photos.

Arge dimidiata

- The hind femur is yellow at the end, or only slightly darkened without clear contrast with the rest of the tibia.
- The front wing has a dark spot under the pterostigma, which covers the basal part of the radial cell and a large part of the second cubital cell.
- The first tergite is black for at least the frontal half (mostly complete dark). Sometimes, the other tergites have dark spots in their middle.

- The sawsheat (bottom plan view) is yellow in the middle and black on the sides.

Arge melanochra

- The hind femur is yellow with a defined black ring at the end.
- The dark spot of the front wing under the pterostigma is limited to the basal part of the radial cell and rarely only a slight part of second cubital cell.
- The first tergite of the female is completely yellow, but the front edge is sometimes black with the males.
- The sawsheat (bottom plan view) is entirely black.

Conclusions

Recent finding of the sawfly *A. dimidiata* in both Belgium and the Netherlands indicate that this rare species can still be encountered, but this species is associated with large forest areas with birches. Besides the occasional observation of adults, searching for larvae on birch leaves appears to be a good method to detect the species. Notably, many recent validated observations were found on the photographic databases of waarnemingen.be and waarneming.nl which highlights the importance of citizen-based observations although validation by taxonomists remains necessary due the similarity with other species. The compiled observations from Belgium and the Netherlands suggest that the species has two generations per year.

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