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An annotated checklist of Belgian Therevidae (Diptera: Asiloidea)

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Abstract

A revision of Therevidae in two Belgian entomological collections showed the current catalogue was in dire need of an update. This paper gives an overview of the material in both the collections of RBINS and FuSagx, and of four private collections. Three species should be omitted from the catalogue as no recent material was found in collections: *Thereva aurata* Loew, 1854, *Thereva circumscripta* Loew, 1847 and *Thereva cincta* Meigen, 1820. For *Thereva fulva* (Meigen, 1820) we could not confirm any previous identification, although we did find one unidentified specimen belonging to this species and therefore the species can remain on the catalogue. Four species, *Pandivirilia caesia* (Meigen, 1838), *Pandivirilia melaleuca* (Loew, 1847), *Thereva inornata* Verrall, 1909 and *Thereva microcephala* Loew, 1847 are reported new to the Belgian fauna.

Keyword: faunistics, stiletto flies, revision, distribution, phenology

Samenvatting

Een revisie van viltvliegen in twee Belgische collecties toonde aan dat een update noodzakelijk was. Deze publicatie geeft een overzicht van het materiaal in zowel de collectie van het RBINS als de collectie van FuSagx, en van vier privé collecties. Drie soorten dienen verwijderd te worden van de Belgische soortenlijst omdat geen materiaal gevonden werd: *Thereva aurata* Loew, 1854, *Thereva circumscripta* Loew, 1847 en *Thereva cincta* Meigen, 1820. Voor *Thereva fulva* (Meigen, 1820) konden we geen enkele van de oude waarnemingen bevestigen, maar tegelijk vonden we een ongeïdentificeerd specimen die tot deze soort behoort. Daarom kunnen we alsnog *Thereva fulva* op de lijst behouden. Vier soorten worden nieuw voor België gemeldt: *Pandivirilia caesia* (Meigen, 1838), *Pandivirilia melaleuca* (Loew, 1847), *Thereva inornata* Verrall, 1909 en *Thereva microcephala* Loew, 1847.

Résumé

Une révision des Therevidae issus de deux collections entomologiques belges a montré que le catalogue actuel avait grand besoin d'une mise à jour. Cet article donne une vue d'ensemble du matériel des collections de l'IRSNB et de FuSagx, ainsi que du matériel de quatre collections privées. Trois espèces doivent être supprimées du catalogue car aucun matériel récent n'a été trouvé dans les collections: *Thereva aurata* Loew, 1854, *Thereva circumscripta* Loew, 1847 et *Thereva cincta* Meigen, 1820. Les identifications antérieures de *Thereva fulva* (Meigen, 1820) ont été invalidées, cependant, l'espèce peut rester dans le catalogue car nous avons trouvé un spécimen non identifié appartenant à cette espèce. Quatre espèces, *Pandivirilia caesia* (Meigen, 1838), *Pandivirilia melaleuca* (Loew, 1847), *Thereva inornata* Verrall, 1909 et *Thereva microcephala* Loew, 1847 sont signalées comme nouvelles pour la faune belge.

Introduction

Therevidae are long and slender flies found especially in arid and semi-arid areas. Adults are most often seen on tracks either for drinking or for depositing eggs in the sandy soil. Sweep-netting low foliage and trees in appropriate habitats also yields [especially male] specimens. All species are very delicate, with bristly legs that break off easily, and the hairs on abdomen and thorax are easily rubbed off when handled. For these reasons, collection material is often in poor state. The wing is usually hyaline and with large discal cell and vein r_{4+5} forked. On one hand many species are grey to brown (e.g., *Thereva*) whereas on the other hand some species are strikingly silvery pubescent (e.g., *Acrosathe*). The larvae are predators of soil or substrate dwelling insect larvae. They are elongate, cylindrical and hard bodied with a sclerotized head capsule.

Material and methods

For identification, there are two recent keys to North West European species: VAN DER GOOT (1985) for North West European species, and FALCK (2011) for the Norwegian species. Both keys are incomplete and, in many cases, it is necessary to run specimens in the keys of KRÖBER (1912, 1913, 1925), LYNEBORG (1968) or LYNEBORG & SPITZER (1974). A key for identification of genera is found in MAJER (1997).

Publications on Belgian Therevidae are scarce: the first papers on Belgian Therevidae are those of GOETGHEBUER (1943) [dealing with collection material] and OLDROYD (1969) [British keys, making references to Belgium]. VAN DER GOOT (1985) included some notes on the Belgian fauna in his publication which he made when examining the collection in the RBINS (Brussels). GOSSERIES (1991) lists the Belgian species in the Belgian Checklist, based on collection material in the RBINS but without re-examining the collection (!), and there is a study about the Therevidae community of East Flemish inland dunes (GROOTAERT *et al.*, 2001). REICHWEIN & VAN DER WIELEN (1996) report *Pandivirilia eximia* new for the fauna of Belgium. Other publications dealing with Belgian Therevidae are unknown to us.

Material in collections obviously represents a major geographical bias in sampling intensity, with the Walloon region severely under recorded. Although we could study over 1.400 Belgian specimens, the patterns of distribution and phenology are still not entirely resolved. The fact we could omit three species from our catalogue, and add another four, simply illustrates the idea we have a lot to discover still. Moreover, huge portions of material in the studied collections proved wrongly identified.

ACRONYMS USED FOR COLLECTIONS

EdB	=	personal collection of Elias de Bree (Amsterdam, the Netherlands)
FuSagx	=	Faculté Universitaire des Sciences Agronomiques de Gembloux (Gembloux, Belgium)
FvdM	=	personal collection of Frank van de Meutter (Tessenderloo, Belgium)
GveW	=	personal collection of Guy van de Weyer (Belgium)
JM	=	personal collection of Jonas Mortelmans (Ghent, Belgium)
JvS	=	personal collection of Jan Versigghel (Aalter, Belgium)
RBINS	=	Royal Belgian Institute for Natural Sciences (Brussels, Belgium)
WodK	=	personal collection of Wout op de Kamp (Antwerpen, Belgium)

All material examined for this publication that is present in the public collections now bears an identification label stating the name of the species in full, gender and: 'Det. E. de Bree 2016' or 'Det. Jonas Mortelmans 2021'. All the collection material of RBINS and FuSagx were digitised and georeferenced; and made available through GBIF (MORTELMANS & DE BREE,

2021). Additionally, material in private collections was re-examined; as well as online records at waarnemingen.be (www.waarnemingen.be), diptera.info (www.diptera.info) and iNaturalist (www.inaturalist.org). These records are not stored in the online repository but have been taken into account for the maps and phenology plots. For visualisation of distribution and phenology, the open-source software R (RSTUDIOTEAM, 2019) was used.

Results

Acrosathe Irwin & Lyneborg, 1981

Males entirely silvery pubescent with long hairs on the face, females without frontal calli. LYNEBORG (1986a) gives a generic account and carefully revised the Palaearctic and Oriental species of this genus and presents a key to species. Only one species is known from north-west Europe: *Acrosathe annulata*.

Acrosathe annulata (Fabricius, 1805)

LYNEBORG (1986a) distinguishes three forms of *Acrosathe annulata* tentatively annotated A, B and C. He reports that form "B" can be found in Belgium without specifying which specimens he studied. During our studies we could not recover specimens of *Acrosathe* with microscope slides or microtubes with dissected male terminalia. Thus, there must be additional material of this species, which is unknown to us.

Acrosathe annulata (form "B") is a common species occurring in coastal dune habitats as well as sandy inland habitats (Fig. 1). It can be found from April to August, with a single peak in May (Fig. 2).

Acrosathe annulata is distributed over a broad European range (LYNEBORG, 1989).

Clorismia Enderlein, 1927

Species of *Clorismia* are slender, bare, and elongate flies; males are very bright silvery pubescent. The face is bare [in contrast to *Thereva*] and the male genitalia are reddish-yellowish. Only three species are known from Europe and one from Japan (LYNEBORG, 1989; NAGATOMI & LYNEBORG, 1987).

Males of *Clorismia* are best identified by studying the shape of the hypopygium and the shape of the aedeagus, distinctly different between both [Belgian] species of *Clorismia*. Distinguishing females of *Clorismia ardea* (Fabricius, 1794) and *C. rustica* (Panzer, 1803) is reported to be difficult, although the key of VAN DER GOOT (1985) is reliable to distinguish both species: in *C. ardea* the black markings on tergite two and three do not reach the front margin of the tergite at the antero-lateral corner (Fig. 3). In *C. rustica* the black markings do reach the front margin of the tergite at the antero-lateral corner (Fig. 4).

Except for one recent observation, the genus is not reported from the Walloon region.

Clorismia ardea (Fabricius, 1794)

= *ruficaudis* (Wiedemann, 1820)

Clorismia ardea is a common species in Flanders, especially on sandy soil, also in more inhabited areas (e.g., females were observed depositing eggs in a sandbox on a children's playground in the city centre of Ghent; pers. comm. JM) (Fig. 1). It can be found from May to July, with a single peak in June (Fig. 2). In the Netherlands usually swept from sparse vegetation on sandy soil (pers. comm. EdB). VAN DER GOOT (1985) reports forests as habitat of choice.

Clorismia ardea is reported from a broad European range occurring in most countries (a full list is given in LYNEBORG, 1989).

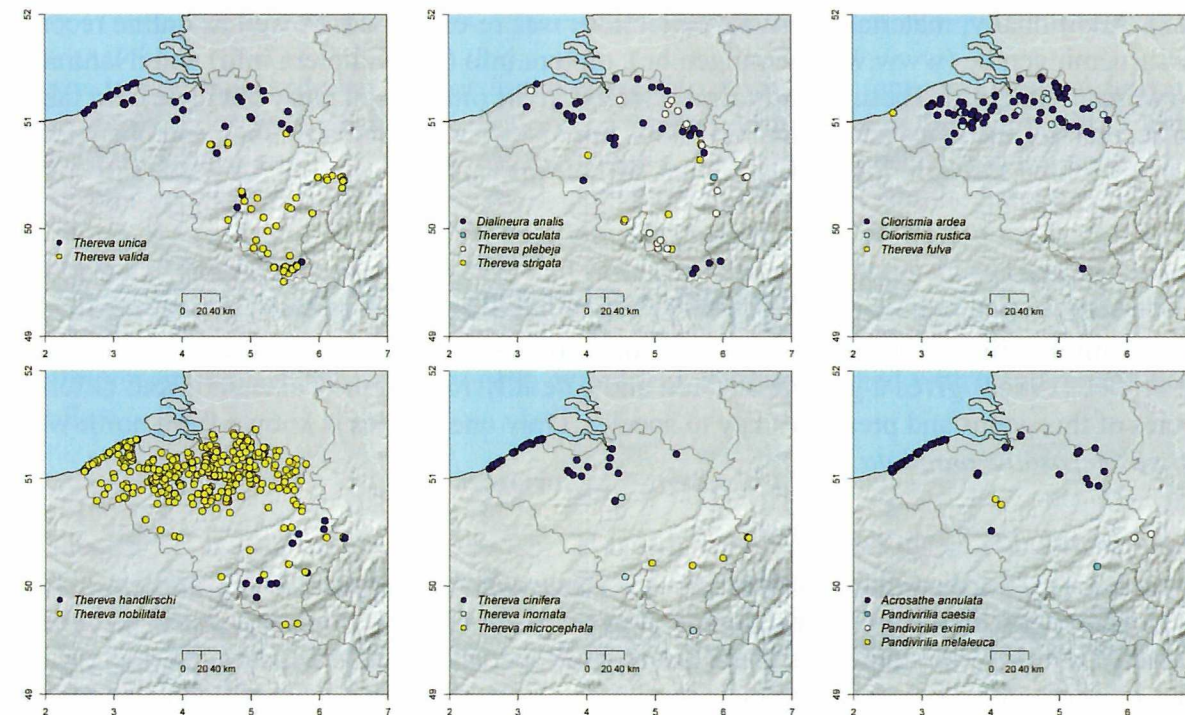


Fig. 1. Distribution maps of Belgian Therevidae.

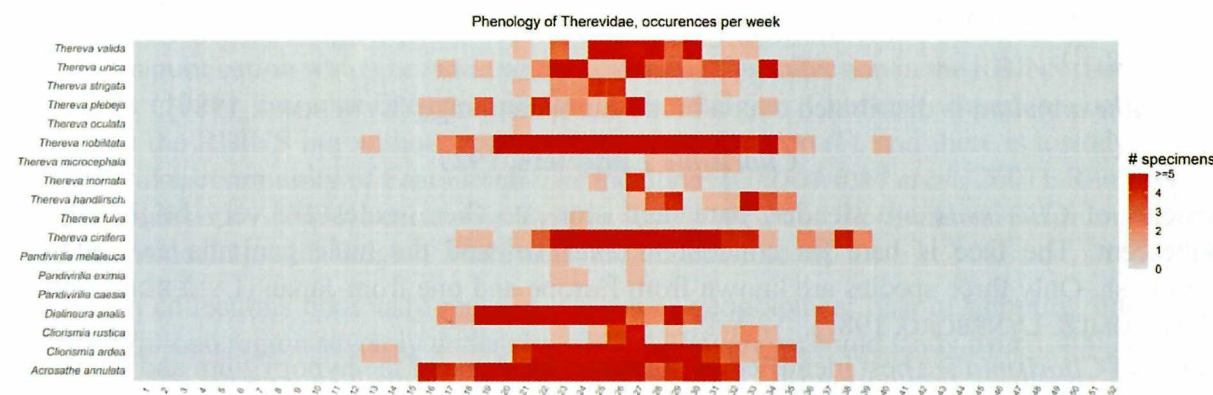


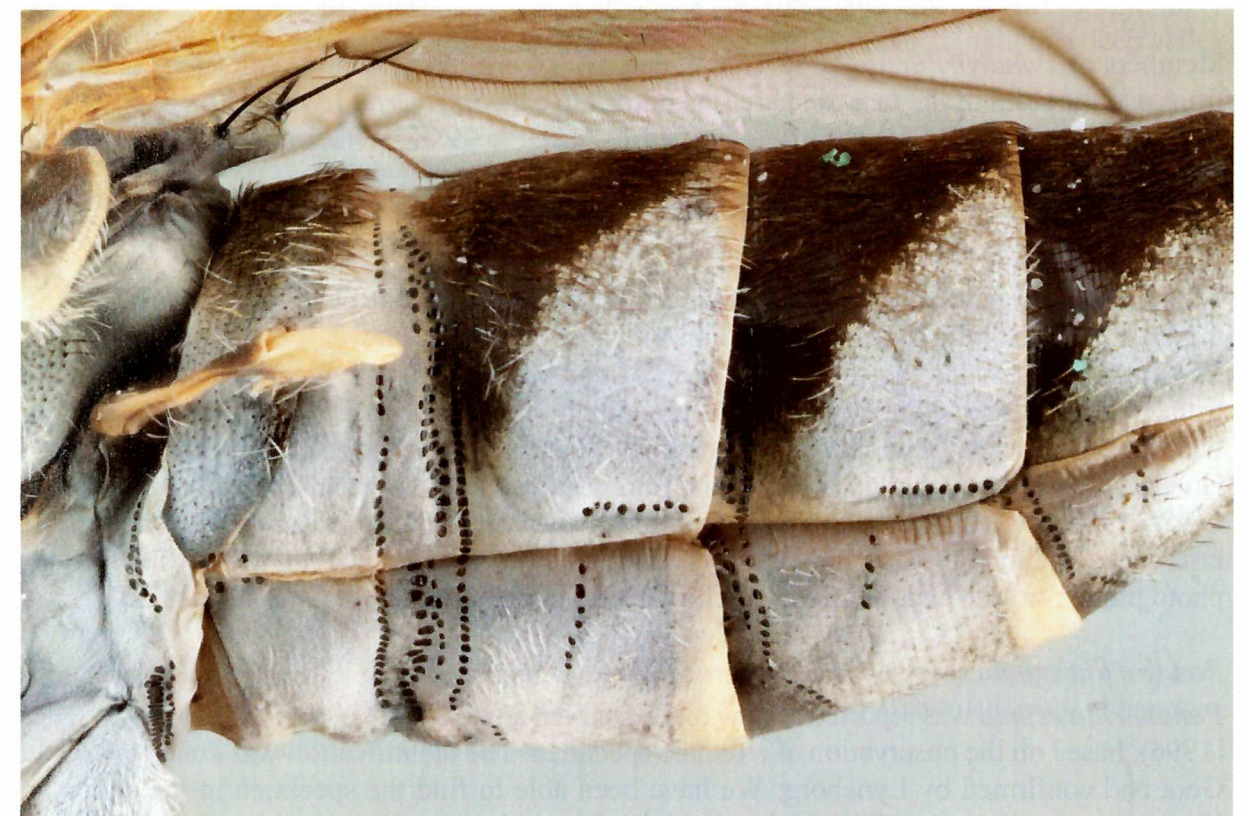
Fig. 2. Phenology of Belgian Therevidae.

Clorismia rustica (Panzer, 1803)

=*confinis* (Fallen, 1815)

Clorismia rustica is a rare species and is not listed to occur in Belgium by LYNEBORG (1989). GOSSERIES (1991) does list the species from the literature, but does not give any specific source. VAN DER GOOT (1985) lists this species as occurring in Belgium but fails to mention details of the studied material or the references that were used. VAN DER GOOT (1985) reports forests as the habitat of choice. The species is especially found on sandy soil in the Campine area, where good numbers of this species have been observed (Fig. 1). It can be found from May to July, with a single peak in July (Fig. 2). From abroad, the species has been caught next to a forest stream in France (pers. comm. EdB).

Clorismia rustica is reported from a broad European range occurring in most countries (a full list is given in LYNEBORG, 1989).

Fig. 3. *Clorismia ardea*, abdominal markings. © Sander Bot.Fig. 4. *Clorismia rustica*, abdominal markings. © Sander Bot.

***Dialineura* Rondani, 1856**

Dialineura is a genus represented by only one species in Europe, *Dialineura anilis*. This is the only genus of Therevidae in North-West Europe with enlarged scape, a broad face and the side of the face without hairs. The slightly enlarged scape can be difficult to spot without having studied a large amount of material. Males have the thorax brownish and the abdomen silver dusted. Females have an entirely brown frons, lacking the shiny frontal calli found in females of *Thereva*.

Dialineura anilis (Linnaeus, 1761)

=*Bibio flavipes* Fabricius, 1794

=*Bibio venosa* Meigen, 1804

=*Bibio sordida* Panzer, 1805

=*Thereva albicans* Macquart, 1834

=*Thereva rufipes* Macquart, 1834

Curiously, when referring to this species on websites the species name is often spelled erroneously as "nalis".

Dialineura anilis is a common species in Belgium, although fewer records are seen the last decade (Fig. 1). It can be found from April to July, with a single peak in June (Fig. 2). It appears to be particularly well abundant in the region of Ghent [due to high sampling efforts of Jan Verbeke and Joseph Charles Bequaert in this region], although recent sightings are rather scarce.

Dialineura anilis is reported from a broad European range occurring in most countries (a full list is given in LYNEBORG, 1989). The species seems relatively common in North East Europe.

***Pandivirilia* Irwin & Lyneborg, 1981**

Members of *Pandivirilia* are large Therevidae, which are rarely seen or collected. The lower frons and the sides of the face are bare [in contrast to e.g., *Spiriverpa* Irwin & Lyneborg, 1981]. Species of *Pandivirilia* are readily identified by using keys in LYNEBORG (1986b) and in DE BREE & VERSCHOOR (2022).

Pandivirilia caesia (Meigen, 1838)

We studied one photograph: 1 ♀, Belgium, Luxembourg, La Roche-en-Ardenne (50.186, 5.555), 25.V.2020, Photo Luc de Wit (Fig. 5).

The specimen remains the sole observation of this species. Despite identification is possible from pictures alone, collection material remains desirable. *Pandivirilia caesia* is a rare but widespread species, reported from Albania, Austria, former Czechoslovakia, Germany, Hungary, Italy, the Netherlands, Romania, European part of Russia and Switzerland (VAN DER GOOT, 1985; LYNEBORG, 1989). The species has been reported to become more common the last decade, although it is not entirely sure whether this is due to higher intensity of photography; or true expansion due to climate change (DE BREE & VERSCHOOR, 2022).

Pandivirilia eximia (Meigen, 1820)

Pandivirilia eximia was reported as new to the Belgian fauna by REICHWEIN & VANDER WIELEN (1996), based on the observation of a female specimen. The identification was done by Van der Goot and confirmed by Lyneborg. We have been able to find the specimen in the collection Natuurmuseum Brabant (Tilburg, the Netherlands) and it is in good condition (pers. ob. E. de Bree & pers. com. Pierre van der Wielen). Recently, there was an additional sighting of this remarkable species on 20.V.2014 by the two authors, E. de Bree and J. Mortelmans, who



Fig. 5. *Pandivirilia caesia*, female (La-Roche-en-Ardenne). © Luc de Wit

spotted a specimen perched atop leaves of *Petasites hybridus* in Ovifat. That is very close to the locality where REICHWEIN & VAN DER WIELEN (1996) made their observation. More recently, three observations were made available from the region of Rocherath, in a deep valley (pers. comm. Wout Opdekamp, Frank Vassen, Jonas Mortelmans).

Pandivirilia eximia is reported from Austria, Switzerland, former Czechoslovakia, Germany, France, Italy, Norway, Poland, Sweden, Finland and the European part of Russia (LYNEBORG, 1989).

Pandivirilia melaleuca (Loew, 1847)

We report *P. melaleuca* as new to the Belgian fauna based on two specimens that were photographed. Larvae of *P. melaleuca* develop in rotten wood of deciduous trees. They are opportunistic predatory feeders and are cannibalistic (OWEN, 1993). This species has been bred from dead wood, both upright and fallen trees, as long as the medium is very dry and, in many cases, devoid of other living predators (ALEXANDER, 2007).

We studied two photographs: 1 ♂, 8.VI.2010, Belgium, Vlaams-Brabant, Neigembos, Gooik (50.810, 4.073), photo by Maite Pedron (ObsID: 48462424) (Fig. 6); 1 ♀, 4.VII.2013, Belgium, Vlaams-Brabant, Pepingen (50.760, 4.157), photo by Lieven Decrick (ObsID: 77292308). No Belgian collection material is known.

Pandivirilia melaleuca is reported from Austria, former Czechoslovakia, France, Germany, Great Britain, Hungary and Italy (BARKEMEYER, 1999; LYNEBORG, 1989). Recently, it has been found in the Netherlands too (DE BREE & VERSCHOOR, 2021).



Fig. 6. *Pandivirilia melaleuca*, male (Neigembos, Gooik, 8.VI.2010). © Maite Pedron.

Thereva Latreille, 1796

In Europe, *Thereva* is the largest genus within the family and nearly all species are very hard to identify. Specimens are brownish to greyish with a hairy face. Important characters for identification are mainly seen in the male aedeagus, in chaetotaxy and by abdominal patterns of pubescence. Females have a distinctive spot on the frons ("frontal calli"), which is usually black and shining and, in many cases, helpful for identification.

The European species in the genus *Thereva* are the most difficult Therevidae to identify due to lacking literature; many European species are only known from limited amount of material; descriptions are based on one sex only; or original descriptions are sometimes the only reference available for identification [these texts often contain no or unusable diagnostic characters]. However, Belgian species are identified rather straightforward thanks to the sources listed above, although a collection of reference material is crucial.

Thereva cinifera Meigen, 1830
= *Thereva subfasciata* Schummel, 1839
= *Thereva modesta* Becker, 1922

Adults are easily identified by the entirely pubescent abdominal tergites [and therefore closely resembling *Thereva fulva*], the yellow knob of halteres, the yellowish wing venation, and characters in the aedeagus or shape of the frontal calli (LYNEBORG, 1974).

It is a common species along the entire Belgian coast with a long period of flight (Fig. 1) easily netted by sweeping along branches and twigs of *Populus alba* in coastal dunes. The species can be found from May to September, with apparently two generations; a first in July; a second in September (Fig. 2). On a European level, the species seems rare, although it is most definitely common along the coastlines of northern France, Belgium and the Netherlands. In the United

Kingdom, *T. cinifera* is considered a rare and near-threatened species with only few records known (HOLSTON, 2017).

Thereva cinifera is reported from a broad European range occurring in most countries (a full list is given in LYNEBORG, 1989), although restricted to central and Mediterranean regions (e.g., occurs only in extreme south of Fennoscandia) (LYNEBORG, 1989).

Thereva handlirschi Kröber, 1912
= *Thereva praestans* Collin, 1948
= *Thereva angustifrons* Collin, 1948
= *Thereva zonata* Kröber, 1912
= *Thereva hilarimorpha* Kröber, 1912

Thereva handlirschi is a large, yellowish species strongly resembling to *T. nobilitata* and *T. inornata*. In general, the black halter knob and the two pair of dorsocentral setae exclude *T. nobilitata* (although *T. nobilitata* can have two pairs of dorsocentral setae). Compared to *T. nobilitata*, females have the calli more heart-shaped ('higher'); have a more distinctly banded scutum (reference collection is essential); and the abdominal pubescence of tergites is more band-shaped (whereas *T. nobilitata* often has triangular offsets across the dorsal midline). Furthermore, females have the halter knob dark, the scutellum completely yellow haired and on femora 3 has a row of uniserial setae [whereas it is multiserial in *T. nobilitata*]; and lacks posteroventral setae basally [posteroventral setae present in *T. inornata*] (see LYNEBORG & SPITZER, 1974). Males are recognized by characters in chaetotoxy; the anteroventral setae on the hind femora are uniserial [whereas it is multiserial in *T. nobilitata*]; the front femora have 2-7 anteroventral setae [1-4 in *T. nobilitata*; check FALCK (2011)]; and the scutellum is completely yellow haired [although some dark, black hairs are often mixed, but never the majority].

Thereva handlirschi is a rare species caught at elevation in the Walloon region. Based on Dutch records from the Veluwe [which is comparable to the Belgian Campine region], we expect *T. handlirschi* to occur at lower elevations in the centre of Belgium. We are aware of one reliable specimen from Genk (pers. comm. Guy van de Weyer). The specimen from Genk was not studied by the authors yet. *Thereva handlirschi* is a typical summer species occasionally caught in larger numbers. It can be found from July to August (Fig. 2).

From abroad *Thereva handlirschi* is reported from a broad range occurring in most European countries (LYNEBORG, 1989). It occurs mainly in northern Europe (here more or less replacing *T. nobilitata*, see LYNEBORG, 1968) and seems to be common in central Europe (LYNEBORG, 1968, 1974).

Thereva inornata Verrall, 1909

Thereva inornata is a very rare species closely resembling *T. nobilitata* and *T. handlirschi*. Compared to *T. nobilitata*, females have the calli more heart-shaped ('higher'); have a more distinctly banded scutum (reference collection is essential); and the abdominal pubescence of tergites is more band-shaped (whereas *T. nobilitata* often has triangular offsets across the dorsal midline) (Fig. 7). Furthermore, the halter knob is dark; and there are some posteroventral setae at the base of femora 3. Males are recognized through characters in male terminalia and in characters in chaetotoxy; the anteroventral setae on the hind femora are uniserial [whereas it is multiserial in *T. nobilitata*]. There is confusion over one feature: the anteroventral bristles of the hind femur. VAN DER GOOT (1985) states they are multiserial, whilst FALCK (2011) states they are usually uniserial. The Belgian specimen from Tervuren has on the left hind femur one seta which is slightly outside the anteroventral row. This is within the variation observed in the



Fig. 7. *Thereva inornata*, female (Virton, Rabais, 26.VII.1917). © Sander Bot.

Norwegian material (pers. comm. M. Falck). It is important to note, such near-to uniserial composition of setae on the hind femora is unseen in Belgian specimens of *T. nobilitata*. From abroad, the species is reported from Austria, Britain, former Czechoslovakia, Finland, France, Italy, Norway, Poland, European part of Russia, Switzerland and Yugoslavia (LYNEBORG, 1989) and seems to have a Northern distribution, although small isolated populations are found in central parts of Europe (LYNEBORG, 1968). In Finland (LYNEBORG, 1968) and Norway (FALCK, 2010) *Thereva inornata* is a dominant, common species replacing *T. nobilitata*.

Thereva fulva (Meigen, 1804)

Thereva fulva is very similar to *T. cinifera*, due to the entirely pubescent abdominal tergites. Both sexes are characterized by the dark halter knob (yellow in *T. cinifera*), females by the different frontal calli, and males by the characteristic aedeagus (with a long apical section). GOSSERIES (1991) lists the species for the Belgian fauna and indicates there are specimens present in the collection of the RBINS. VAN DER GOOT (1985) mentions that the Belgian identifications in the RBINS are doubtful. After examination of all the specimens identified as *T. fulva*, we could not confirm a single specimen. All *T. fulva* belonged to *T. cinifera*, *T. nobilitata*, *T. unica* or *T. valida* and no material of *T. fulva* was found. However – a specimen discovered amongst series of Syrphidae, in the unidentified materials in the RBINS, just prior to publication proved the occurrence of this species in De Panne. This specimen remains the sole Belgian specimen of *T. fulva* so far.

Even on a European scale *Thereva fulva* is a rare species. The sole Belgian record was seen on June 13th (Fig. 2). *Thereva fulva* occurs on a wide European scale, and is found in neighbouring countries such as Great-Britain, Germany and France (LYNEBORG, 1989), but seems to be avoiding higher latitudes. The species was found in inland habitats though (SMIT & REEMER, 2009).



Fig. 8. *Thereva microcephala*, female (La-Roche-en-Ardenne, 14.VII.2011). © Luc de Wit.

Thereva microcephala Loew, 1847

Thereva microcephala is a rather distinctive species: females are characterized by a broad frontal callus that extends to the anterior ocellus; the pubescent bands on tergite two, three and four are separated by a shiny area [but connected through a 'velvety band' on the extreme posterior margin, although this is not clearly visible/discernible in many specimens]. Males are very slender, elongate flies with light-grey (near white) setulae on abdomen and thorax, indistinct longitudinal stripes on thorax and black legs with a very specific chaetotaxy. The tibiae are longer than the femora.

Seeing the distribution and the habitat of the Belgian specimens, the choice of habitat clearly differs on different latitudes. Belgian specimens were found in the more elevated parts of the country. The habitat was deciduous and mixed forests mostly consisting of *Fagus* and *Picea*. All currently known records are detected in July and August (Fig. 2), although it is not clear whether it is just a very rare under recorded species, or it has a very short period of flight only. It is remarkable only one historic specimen (in the RBINS) is known; the four other specimens came from the last decade.

We studied four photographs: 1 ♂, 9.VIII.2008, Belgium, Luxemburg, Commanster, (50.252, 6.01), Photo J. Lindsey; 1 ♀, 14.VII.2011, Belgium, Luxemburg, La-Roche-en-Ardenne, (50.194, 5.545), Photo L. de Wit (Fig. 8); 1 ♀, 24.VII.2014 Belgium, Liège, Rocherath (50.451, 6.374), leg. J. Versighel (Fig. 9); 1 ♀, 27.VII.2018 Belgium, Liège, Rocherath (50.456, 6.357), leg. J. Versighel.

T. microcephala is reported from Austria, former Czechoslovakia, Denmark, Finland, Germany, Italy, Norway, Poland, Romania, Sweden, Switzerland (LYNEBORG, 1989; FALCK, 2011) and more recently, from the Netherlands (DE BREE *et al.*, 2019). As FALCK (2011) notes the distribution forms a remarkable axis from north to south right through central Europe. In Norway and Finland, it's curiously reported to be a species of the coast (FALCK, 2011).

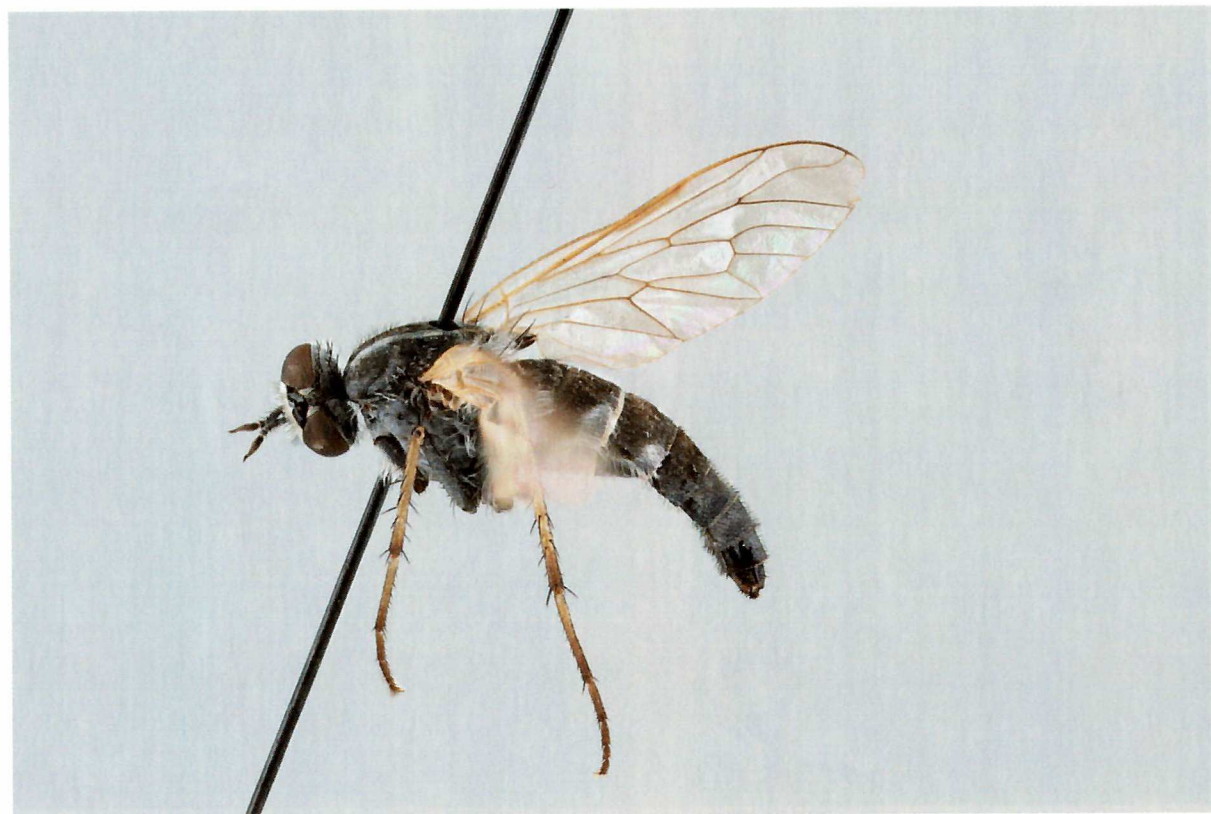


Fig. 9. *Thereva microcephala*, female (Rocherath, 24.VII.2014). © Sander Bot.

Thereva nobilitata (Fabricius, 1775)
 = *Thereva monos* (Harris, 1780)
 = *Thereva hirtus* (De Geer, 1776)

The most common Therevidae in Belgium frequently swept from small bushes and shrubs. The species has a large variability in colour, which makes distinguishing specimens of *Thereva handlirschi* and *T. inornata* difficult, especially from photographs. To distinguish these species, we refer to the descriptions of *T. handlirschi* and *T. inornata*.

The species can be found on a wide geographic range without a clear choice of habitat (Fig. 1) from May to August, with a single peak in June (Fig. 2).

Thereva oculata Egger, 1859

A very rare species currently known from one photographed specimen only, sent to the authors. Females are recognised by the separated calli, touching the eye margin, and a rather distinctly striped scutum. The pattern of abdominal pubescence is striking, with tergites 1-5 unicolorous yellowish-grey [with indistinct anterior pubescence] and tergites 6-7 predominantly pubescent, but more distinct shiny black on anterior end. The males are only identifiable based on male terminalia; illustrated in LYNEBORG & SPITZER (1974).

The species is only known from Spa, at the foot of the Hautes Fagnes (Fig. 1), end of May. In France caught in deciduous forest together with *T. strigata* (pers comm. E. de Bree).

We studied one photograph [the sole image of a living *T. oculata* known to the authors!]: 1 ♀, Liège, Spa, 25.V.2012, Photo C. Devillers (Fig. 10). To date, no Belgian material has been collected.

Thereva oculata is reported from Austria, Switzerland, former Czechoslovakia, Finland, France, Hungary, Italy and Romania (LYNEBORG, 1989).



Fig. 10. *Thereva oculata*, female (Spa, 25.V.2012). © Christine Devillers.

Thereva plebeja (Linnaeus, 1758)
 = *Thereva fasciatus* (De Geer, 1776)
 = *Thereva lugens* Loew, 1847
 = *Thereva lichtwardti* Kröber, 1913

Thereva plebeja is a rare species with females recognized by the very large, conspicuous frontal calli nearly reaching anterior ocelli and touching the eyes [no pubescent strip between eye and callus]; and the males are recognized by their terminalia. The species especially resembles *T. strigata*, but differences are discussed under that species.

The species can be found in a wide geographic range and seems to be more abundant in the high altitude regions of the Hautes Fagnes and the Ardennes (Fig. 1); although some (low altitude) occurrences from especially the Campine region are known. The occurrences in Flanders are in accordance with those in the Netherlands, where the species is frequently caught on inland sandy soils. Belgian records originate from May to August, with a single peak in June (Fig. 2).

Thereva plebeja is reported from a broad European range occurring in most countries (a full list is given in LYNEBORG, 1989).

Thereva strigata (Fabricius, 1794)
 = *Thereva latistriata* Kröber, 1913
 = *Thereva thermophila* Trojan, 1970

Thereva strigata is a very rare species with females recognized by the very large, conspicuous frontal callus nearly reaching anterior ocellus and touching the eyes [no pubescent strip between eye and callus]; and the males are recognized by their terminalia. The species is resembling *T. plebeja* although females are described to have slender spines on the tip of ovipositor (broad and blunt in *plebeja*), a difficult character that needs a reference collection. Males are characterised by a bluish-grey mesonotum, with at most a vague central line (*T. plebeja* is greyish brown with usually a clear, dark brown central line); and the hairs on tergite 1 are grey or yellowish medially (blackish in *T. plebeja*). Furthermore, in general appearance (for both

sexes), *T. strigata* is a light coloured, even bluish-grey species (dark brownish grey species). Both species have the abdominal margins of tergite 4-5 with a large shiny area, and the pubescent areas on these tergites are relatively small compared to other species (and therefore resembling, to some extent, *Thereva cincta*).

Thereva strigata is reported from a broad range occurring in most European countries (a full list is given in LYNEBORG, 1989).

The species is considered very rare, although it is found in a wide geographic range (Fig. 1). Belgian records originate from May to August, with a single peak in June [note the data is too scarce to detect true patterns of phenology], resembling the phenology of *T. plebeja* (Fig. 2). It is caught in forests and on calcareous grassland (STUKE, 2008), which are in line with the Belgian observations.

Thereva unica (Harris, 1780)

= *Sylvicola unicus* Harris, 1780

= *Bibio lugubris* Fabricius, 1787

= *Thereva albilabris* Meigen, 1820

= *Thereva albipennis* Meigen, 1820

= *Thereva bipunctata* Meigen, 1820

= *Thereva canescens* Zetterstedt, 1859

= *Neothereva frontata* Kröber, 1912

= *Thereva vulpina* Kröber, 1912

= *Neothereva hemaphrodita* Becker, 1922

Female *Thereva* from North-West Europe are easily recognised as *T. unica* by the frontal calli, which have the shape of two, clearly separated, circles. From Belgium, only *Thereva oculata* shares this character [differences giving under that species]. Males are more difficult to identify, although the pale hairs on the abdomen give a good clue. The male aedeagus is yet again a helpful character for specimens from the North-West European region, as the distiphallus has a large bump in it not seen in any other (described) species. Identifications of *T. unica* from these southern regions should be considered with care. The long list of synonyms indicates the species is rather variable in size and shape. In most literature, the species is erroneously annotated as its synonym *T. bipunctata*.

The species can be found in a wide geographic range, but is strongly associated with sandy soils along the coastline and on inland sand dunes, but it is also found in sandy quarries (Fig. 1). Adults can be found from April to September, with a single peak in July (Fig. 2).

Thereva unica is reported from a broad European range occurring in most countries (a full list is given in LYNEBORG, 1989).

Thereva valida Loew, 1847

= *Thereva ursina* Wahlberg, 1854

= *Thereva frontalis* Schummel, 1839

Thereva valida is a large and dark species, of which females are easily recognized due to the broad, narrow frontal callus; the lack of posteroventral setae on the third femur; and the black setulae from the hind margin of tergite 4 onwards. Males are difficult to identify, and characters in its aedeagus have to be used to avoid confusion with other dark *Thereva* (LYNEBORG & SPITZER, 1974).

Thereva valida is considered a common species in the elevated high-altitude parts of Belgium, especially on sandy soils (Fig 1). In the Netherlands, it is a rare species of inland forests (pers. comm. EdB). Adults can be found from June to July, with a single peak early July (Fig. 2).

Thereva valida is reported from a broad European range occurring in most countries (a full list is given in LYNEBORG, 1989).

Discussion

ACCOUNT OF OMITTED SPECIES

Thereva circumscripta Loew, 1847

= *Thereva niveifacies* Kröber, 1912

Thereva circumscripta is an enigmatic and poorly known species with its center of distribution in the Mediterranean, known also from Germany, Denmark, Switzerland, France, Greece and Hungary (LYNEBORG & SPITZER, 1974; BARKEMEYER, 1999; LYNEBORG, 1989), therefore it is absent in most North-West European keys (e.g., LYNEBORG & SPITZER, 1974; VAN DER GOOT, 1985; FALCK, 2011). Even today, identification of this taxon is extremely troublesome. According to literature the species is resembling *Thereva valida*, especially the females of which both species have a narrow, transverse strip of pubescence on the frons. Males of *T. circumscripta* have not been described yet, so we simply do not know how to recognize them. LYNEBORG (1968: 173) assigned a female lectotype for *T. circumscripta* out of the two syntypes (the original type series of Loew included two females: one from Slesia, which is now considered a species of *T. valida* Loew, 1847, and one female from southern France, which is now the lectotype of *circumscripta*) but did not include a redescription nor any information on how to separate both species. Lyneborg indicated that he has seen a large series from Corsica conspecific with *T. circumscripta* but did not mention if there were also males in this series. GOSSERIES (1991) lists this species as present in the collection of the RBINS, and we could find four specimens in the collection bearing a label with the name *T. circumscripta*: two males and two females from Ciney, Hockai, Hockai and Buzenol respectively. They clearly belong to *T. valida* and were so identified by Lyneborg. All specimens have an identification label "*Thereva valida*/Lyneborg det. 1968". After examining the collection, no other specimens of *T. circumscripta* could be found.

Thereva aurata Loew, 1854

= *Thereva auricincta* Egger, 1859

= *Thereva corinneae* Gosseries, 1991

The species is described from Turkey, and it has been recorded from Austria, former Czechoslovakia, Greece, Hungary, Italy, Romania, and former Yugoslavia (BARKEMEYER, 1999; LYNEBORG, 1989). As the species is easily recognizable due to its entirely bright orange legs [a unique feature among the European species of *Thereva*] and two bright longitudinal stripes on its thorax; it is often possible to identify the species on citizen science platforms making it a relatively well-known species. On the list of GOSSERIES (1991) *T. aurata* is listed as *Thereva corinneae* Gosseries, nom. nov, without further explanation. Under the species there is to be read: "*aurata* Loew, 1854 (preocc. Harris 1835)", HARRIS (1835) is a catalogue of material collected by Harris in Massachusetts in the United States of America. In that publication the usage of the name "*aurata*" is not an original description. Thus, the name *Thereva aurata* Harris, 1835 is a nomen nudum. Replacement of *T. aurata* is therefore unjustified (HOLSTON, 2004). HARRIS (1835) actually recorded the Nearctic species *Thereva frontalis* Say, 1824. Furthermore, JOHNSON (1925) already corrects HARRIS (1835) and points out that Harris himself corrected himself in his personal notes.

In RBINS, a female of *T. valida* bears a label with the name *aurata* as identified by Otto Kröber. The specimen clearly belongs to *T. valida* and was so identified by Lyneborg. The specimen has an identification label "*Thereva valida*/Lyneborg det. 1968". Seeing its European

distribution, it is highly unlikely to occur in Belgium. Hereby the species is removed from the Belgian fauna.

Thereva cincta Meigen, 1829
 = *Thereva arcuata* Loew, 1847
 = *Thereva taeniata* Meigen, 1820
 = *Thereva anthracoides* Macquart, 1840

In Europe, the species is found in Albania, Austria, former Czechoslovakia, Denmark, France, Germany, Greece, Hungary, Italy, Poland, Romania, Russia, Switzerland and former Yugoslavia (LYNEBORG, 1989, BARKEMEYER, 1999). Further records are known from Asia, Israel, Syria and Turkey (LYNEBORG, 1989, BARKEMEYER, 1999). GOSSERIES (1991) listed this species as *Thereva arcuata* based on material present in the collection of the RBINS: there are in fact three specimens in the collection bearing a label with the name *T. arcuata* identified by Otto Kröber. Two from Auby and one from Steinbach. They clearly belong to *T. valida* and were so identified by Lyneborg ("*Thereva valida*/Lyneborg det. 1968"). After examining the entire collection, no specimens of *T. cincta* could be found. Hereby the species is removed from the Belgian fauna. Despite omitting the species from the catalogue, we do consider it is possible the species occurs in Belgium due to distribution of the species in nearby regions [e.g., specimens just north of Paris were studied by the first author].

ACCOUNT OF EXPECTED SPECIES

As described above, *T. cincta* is especially expected to occur in Belgium purely on distributional data. Following the French and German checklists, a larger number of *Thereva* species can be expected to occur in Belgium, which are not present in the keys of VAN DER GOOT (1985) and FALCK (2011); as they are often enigmatic, poorly known species that are insufficiently described (KRÖBER, 1912, 1913, 1925). Six species are widespread over Europe: *Thereva apicalis* Wiedemann, 1821 [widespread over central and southern Europe]; *Thereva brevicornis* Loew, 1847 [higher altitude regions in central and southern Europe]; *Thereva lanata* Zetterstedt, 1838 [widespread]; *Thereva marginula* Meigen, 1820 [widespread]; *Thereva rustica* Loew, 1840 [Central and East Europe] and *Thereva spinulosa* Loew, 1847 [Mediterranean]. A further five species are endemic to neighbouring countries and are in all cases known for one sex only: *Thereva maculipennis* Kröber, 1912 [only males known (KRÖBER, 1912 wrongly states the species is known from females only); endemic to 'France']; *Thereva canescens* Kröber, 1912 [endemic to Bavaria (Bayern), Germany; the species is only known by females]; *Thereva hyalina* Kröber, 1913 [endemic to Hamburg-Bergedorf, Germany; the species is only known by males]; *Thereva nitida* Macquart, 1934 [endemic to Bordeaux, France; the species is only known by females]; *Thereva subnitida* Kröber, 1913 [endemic to Bavaria (Bayern), Germany; the species is only known by a male].

When comparison is made with the Dutch list *Thereva lanata* Zetterstedt, 1838, although rare in the Netherlands, can be expected to be found in Belgium. The species is found in the Netherlands on heathland in June and July (and is easily recognized due to the enormous frontal callus extending latterly to the ocellus). Also, *Thereva neglecta* Kröber, 1912 is reported from the Netherlands, by VAN DER GOOT (1985) [Vlieland, 24.VII.1951] and BARENDREGT (1980) [Vlieland, 11.VII.1974]. Despite the two records, *Thereva neglecta* was not included in the Dutch catalogue by VAN DER GOOT & BEUK (2002) as it was found a misidentification by THEOWALD (1952). This matches with *T. neglecta* being a Central Asian species (LYNEBORG, 1969).

Finally, from the dune area in De Panne, instead of; and just a few kilometres south of De Panne (Bray-Dunes, Northern France) a series of very dark *Thereva* were collected by J. Mortelmans, which could not be identified to any currently known North-West European species. The species was found in a dry dune area, where males and females both perched on the soil. Although no name could be assigned to this taxon yet, it seems to be related to *T. circumscripta*. Until the issues with this taxon (see above *T. circumscripta*) are dealt with, we keep these records as '*Thereva spec.*'.

Finally, from other genera than *Thereva*, we might expect *Dichoglana nigripennis* (Ruthe, 1831). This species is characterised by a bare face, the black/dark red tibiae and the dark halteres. It is found in Germany (BARKEMEYER, 1999, LYNEBORG, 1989).

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Le genre *Oreina* Chevrolat, 1837 en Belgique (Coleoptera: Chrysomelidae)

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Abstract

The genus *Oreina* has been recorded more than 36 times in literature or in different collections. A history of the presence in Belgium is presented as well as the characteristics of the genus. Seven species are listed, accompanied by a commentary on their presence in the country and in Europe.

Keywords: atlas, Belgium, chorology, entomology, catalog

Résumé

Le genre *Oreina* a été relevé plus de 36 fois dans la littérature ou dans différentes collections. Un historique de la présence en Belgique est présenté ainsi que les caractéristiques du genre. Sept espèces sont présentées, accompagnées d'un commentaire sur leur présence dans le pays et en Europe.

Samenvatting

Het genus *Oreina* werd al meer dan 36 keer vermeld in de literatuur of in verschillende collecties. Een geschiedenis van de aanwezigheid in België wordt geschetst, evenals de kenmerken van het genus. Zeven soorten worden opgelijst, samen met een bespreking van hun aanwezigheid in het land en in Europa.

Introduction

À l'exception d'une espèce qui s'aventure en plaines et collines (*O. caerulea* (Olivier, 1790)), le genre *Oreina* est généralement cantonné dans les régions froides ou sur les reliefs, subalpins voire alpins. Dans la littérature belge, il y a peu de mentions d'observations du genre dans le pays or, lors des dernières décennies, nous avons pu rassembler plusieurs dizaines d'individus appartenant à différents taxons. Selon nos lectures et nos recherches, quatre d'entre eux n'ont jamais été signalés du pays et ne sont donc pas repris dans les catalogues nationaux. Toutes les espèces observées en Belgique, ou à proximité, le furent par des exemplaires isolés répartis dans l'ensemble du territoire (Fig. 1) et de façon sporadique sur une longue période, de 1862 à 2016. Soit en moyenne un individu tous les cinq ans mais avec, jusqu'à plus ample informé, une absence surprenante entre approximativement les années 1950 et 1980.

À noter que cette absence fut observée pour d'autres espèces, *Gonioctena linnaeana* (Schrank, 1781) par exemple, pour laquelle nous n'avons pas non plus connaissance de captures entre 1954 (Derenne) et 1972 (Beaulieu). Faut-il voir une cause commune à cette absence pendant ce laps de temps ?