

Note on the distribution of *Leptura aurulenta* Fabricius, 1792 in Belgium (Coleoptera : Cerambycidae : Lepturinae)

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Summary

The distribution of *Leptura aurulenta* Fabricius, 1792 in Belgium has always been confined to the extreme south of the country. Recently, this species has been discovered in the central and northern parts of Belgium. The available collection material of the species is reviewed and its historical and current distribution documented. These findings are presented and discussed here.

Keywords : Coleoptera, Cerambycidae, Lepturinae, *Leptura aurulenta*, Belgium, distribution, new records.

Résumé

La distribution de *Leptura aurulenta* Fabricius, 1792 en Belgique s'est toujours limitée à la partie extrême sud du pays. Récemment, cette espèce vient d'être découverte dans les parties centrale et nord de la Belgique. Le matériel disponible en collection pour cette espèce a été revu et la distribution historique et récente de *L. aurulenta* en Belgique documentée. Ces nouvelles captures sont signalées dans cette note et une discussion sur l'actuelle distribution de l'espèce est présentée.

Samenvatting

De verspreiding van *Leptura aurulenta* Fabricius, 1792 is in België altijd beperkt geweest tot het uiterste zuiden van het land. Recent is deze soort echter ontdekt in het centrum en noorden van België. Het beschikbare collectiemateriaal van de soort is onderzocht en de historische en actuele verspreiding in België gedocumenteerd. Deze resultaten worden hier voorgesteld en besproken.

Introduction

Leptura aurulenta Fabricius, 1792 (Figs 1-2) is a longhorn beetle belonging to the subfamily of the Lepturinae, in the tribe Lepturini. The species occurs in a large part of Europe and northern Africa (SAMA & LÖBL, 2010), with the northern limit of its distribution going through southern Ireland, southern England, Belgium and Germany (BENSE, 1995 ; DU CHÂTENET, 2000).

In the neighbouring countries it is absent from the Netherlands (ZEEGERS & HEIJERMAN, 2008 ; TEUNISSEN, 2009 ; VORST, 2010). In Germany it occurs in both Rheinland-Pfalz and Saarland, where it is widespread without being common (NIEHUIS, 2001). In Nordrhein-Westfalen it only seems to occur in the south : in 1955 it was caught in the Eifel (Nettersheim-Bouderath), and in 1989 in Wachtberg-Berkum near the Rhine (BAUMANN, 1997). It is present in Luxembourg (MOUSSET, 1973 ; GEREND *et al.*, 2007 ; KÖHLER, 2009). In France it occurs everywhere (PLANET, 1924 ; DU CHÂTENET, 2000), but is rare in the extreme north of France (PICARD, 1929 ; VILLIERS, 1978 ; BERGER, 2012). It is present in Alsace (MATTER, 1998), and has been found at Merles s/Loison, situated at only 15 km south of Torgny and the historical Belgian distribution (DELWAIDE, 1998). However, the species is not included in the beetle catalogue of the French Ardennes (LIGERON, 2005). In Britain it is present in the south of England and Wales (TWINN & HARDING, 1999).

In the oldest catalogues of Belgian Cerambycidae (MATHIEU, 1860 ; LAMEERE, 1894 & 1900) the species is not cited. In the Dutch catalogue of EVERTS (1903), containing many Belgian records, it is also not mentioned from Belgium.

The first published reference to this species in Belgium that we could find is a short record in the account of the monthly meeting of the Belgian Entomological Society on the 4th of September 1909. During this meeting, Mr Bondroit mentions the capture of *Leptura aurulenta* in Chiny by Mr Frennet (ANONYMOUS, 1909). A part of the collection Frennet (16.049 beetles from the Belgian fauna) comprising the Cerambycidae entered the collections of the Royal Belgian Institute of Natural Sciences (RBINS/IRSNB) in Brussels under the register number 17.207. It was acquired by the RBINS directly from the widow of Mr. Frennet. In this set of the Frennet's collection, 5 specimens (3 males and 2 females) of *Leptura aurulenta* are present and were all collected in June 1908. A specimen was also collected in Chiny in 1911 but the species was not collected in Chiny by Frennet himself during a collect from 6 to 9 June 1920 (FRENNET, 1920). In the third volume of Coleoptera Neerlandica (EVERTS, 1922), this record is taken over as "near Chiny".

Since then, many captures are known or published, always from the extreme south of Belgium. Many published captures attest to this (sometimes as *Strangalia aurulenta*), especially since the 1970's :

- Auby s/Semois, IX.1924, 1 male, leg. Giltay (ANONYMOUS, 1924) ;
- Izel, 26.VII.1953 (VERSTRAETEN, 1972) ;
- Torgny, 27.VII.1974, leg. Boosten (ANONYMOUS, 1974) ;
- Fouches, "Lagland", in the rotten birch (*Betulus*) trunk, 11.VI.1978, 3 ex. & 5.VII.1978, 1 ex. ex larva (ROUARD, 1980) ;
- Ethe, Vallée du Rabais, 2.IX.1980 (BAERT *et al.*, 1981) ;
- Ethe, Croix Rouge, 27.VI.1993, 1 male & 2 females on dead beech trunks, leg. N. Büscher (BÜSCHER, 1994) ;
- Ethe, 21.VII.1991 (LEMPEREUR *et al.*, 2000) ;
- Lagland & Bois de Prire, 2002-2003 (FAYT *et al.*, 2006).

With the capture in Auby s/Semois in 1924, the distribution of this species in Belgium is given as the Semois valley (ANONYMOUS, 1924). MUYLAERT (1984) gives a map of the Belgian distribution which indicates an occupation range for the species restricted to the extreme southern part of the country. However, on this map figures an unchecked literature record northeast of Couvin. This is most likely attributable to DEBATISSE (Catalogue des Cerambycidae de Belgique, *in litteris*, deposited at the RBINS in the 1970's), where the distribution is stated as : "AC v. de la Semois et Jur. Ailleurs : Roly (24.VIII.1936, Goetghebuer)". This specimen from Roly could not be found in the Goetghebuer collection in the Universiteit Gent, Museum voor Dierkunde (UGMD). In this collection, there is however a female *Leptura quadrifasciata* Linnaeus, 1758 with label data "Roly, 4.VIII.1936, M. Goetghebuer (UGMD11122)", misidentified as *Leptura aurulenta*. The unchecked literature record in MUYLAERT (1984) was thus probably based on this misidentification, and should not be taken into account.

An unexpected result of the study of the *L. aurulenta* specimens in UGMD consists of the discovery of the first known Belgian capture of this species. This specimen, a female, has been collected in August 1900 in Sainte-Cécile by Goetghebuer, and has been unpublished until now.

Material and methods

Seven specimens were recently collected by the authors in Flanders, as part of larger sampling campaigns for saproxylic beetles.

Five forests in and near Merelbeke (near Gent, Prov. Oost-Vlaanderen) were sampled in 2007-2009 as part of an inventory of saproxylic beetles in these forests (Smets, unpublished data). Used methods were hand collecting and beating.

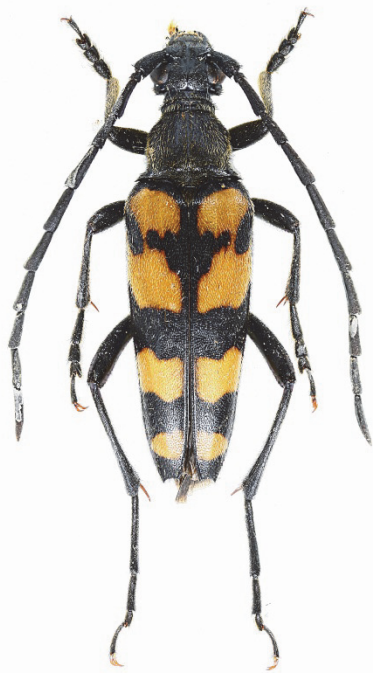
Forest reserve Kolmont (Tongeren, Prov. Limburg) was sampled intensively with a variety of traps and sampling techniques during 2008-2009 (KÖHLER *et al.*, 2011 ; VANDEKERKHOVE *et al.*, 2011).



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Figs 1-2. *Leptura aurulenta* Fabricius, 1792, habitus, dorsal view. Fig. 1. Male, 17 mm., Orval, 15.VII.1960, E. Derenne leg., in EDC. Fig. 2. Female, 18 mm., Croix-Rouge, 20.VIII.1958, E. Derenne leg., in EDC. Figs 3-4. *Leptura quadrifasciata* Linnaeus, 1758, habitus, dorsal view. Fig. 3. Male, 14 mm., Fond de Quareux, Liège, 3.VI.2011, F. Leduc leg., in ADC. Fig. 4. Female, 16 mm., same locality and date, F. Leduc leg., in ADC.

Used methods were window traps, baited window traps, sticky traps, light traps, sieving, beating and hand collecting.

Besides sampling, collection material of *Leptura aurulenta* in RBINS, UGMD and GxABT was reviewed, as well as in several private collections. This was part of a digitalisation project of saproxylic beetle collection material, conducted since 2009 at RBINS and a large number of private collections. This project, sponsored by GBIF (Global Biodiversity Information Facility), aims to form an up to date Belgian catalogue of saproxylic beetle species, and to bring together the dormant distribution data residing in collections. Species lists and distributional data are available freely on-line : <http://projects.biodiversity.be/beetles>.

Direct observations in the field realised by recognised entomologists and documented with pictures have also been taken into account.

Finally, all available Belgian literature and internet records of this species were searched.

Collections examined and abbreviations used

ADC : Alain DRUMONT collection, Brussels, Belgium ; EDC : Emile DERENNE collection, housed in RBINS ; FGC : Félix GUILLEAUME collection, coll. Royal Belgian Entomological Society, housed in RBINS ; FLC : Frédéric LEDUC collection, Herstal, Belgium ; GxABT : Conservatoire entomologique de Gembloux, Unité d'Entomologie fonctionnelle et évolutive, Gembloux Agro-Bio Tech, Université de Liège, Belgium ; GBC : Guy BOOSTEN collection, Ath, Belgium ; JLC : Joseph LEROUX collection, housed in RBINS ; KSC : Koen SMETS collection, Antwerpen, Belgium ; LCC : Luc CREVECOEUR collection, Genk, Belgium ; MGC : Marcel GALANT collection, Nivelles, Belgium ; MRC : Michel ROUARD collection, Rance, Belgium ; PMC : Patrick MURET collection, Waterloo, Belgium ; RBC : Rob BOSMANS collection, Gent, Belgium ; RBINS/IRSNB : Royal Belgian Institute of Natural Sciences, Brussels, Belgium (Belgium general collection) ; RDC : Roland DELEDICQUE collection, Brussels, Belgium ; RGC : Roger GROTZ collection, Malmédy, Belgium ; UGMD : Universiteit Gent, Museum voor Dierkunde, Gent, Belgium ; YTC : Yves THIEREN collection, Baelen, Belgium.

Results

MATERIAL EXAMINED : 103 specimens in total, excluding the records obtained from direct observation, available on Internet and on the cards from the GxABT :

Oost-Vlaanderen province : 1♀, **Merelbeke**, Gentbos, on large dead beech (*Fagus sylvatica*), 14.VII.2007, leg. K. Smets (KSC, will be deposited in RBINS) ; 1♀, Merelbeke, on pavement Gaversesteenweg 181 (in front of castle park Blauwhuis), 19.VIII.2007, leg. K. Smets (KSC) ; 1♂ & 1♀, Merelbeke, Makegemse Bossen, Bruinbos, in copula on dead beech (*Fagus sylvatica*), 30.VI.2009, leg. K. Smets (KSC) ; 1♀, same locality and date, ovipositing on dead beech (*Fagus sylvatica*), photographed, not collected.

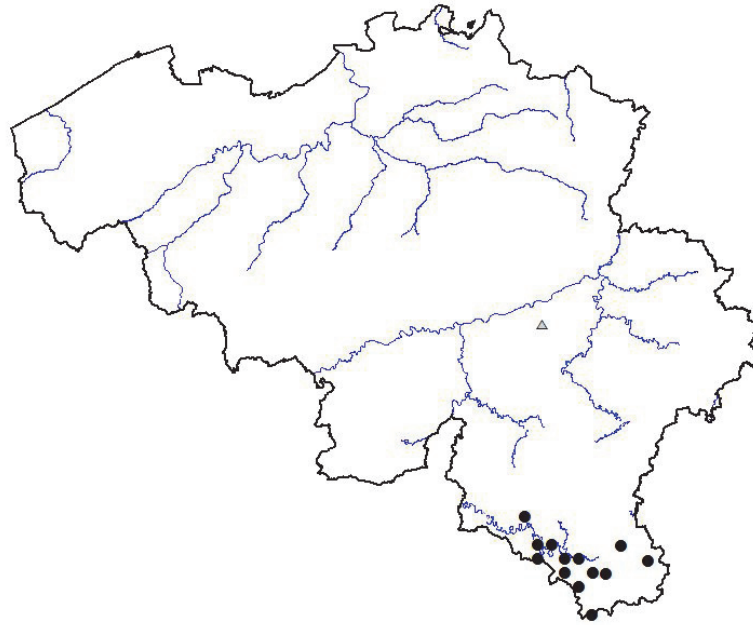
Additional Internet records : Two specimens were observed and photographed on the edges of Bruinbos (Makegemse Bossen, 13 & 28.VII.2012, Bart Lutin-Smet, posted with picture provided on the website www.waarnemingen.be). This is the same forest where the species was observed in copula in 2009. One specimen was photographed in Kwenenbos (11.VII.2012, Kris Verplaetse, posted with picture provided on the website www.waarnemingen.be). This new site is situated 700 meters from Gentbos, where the species was found in 2007, and lies in between all findings in Merelbeke.

Limburg province : 1♂ & 1♀, **Tongeren**, Kolmont forest reserve, window trap on large dead beech (*Fagus sylvatica*) snag, 21.VI.-3.VIII.2008, leg. L. Crevecoeur (LCC) ; 1♀, same locality and same window trap on large dead beech (*Fagus sylvatica*), 28.VIII.-20.IX.2008, leg. L. Crevecoeur (LCC).

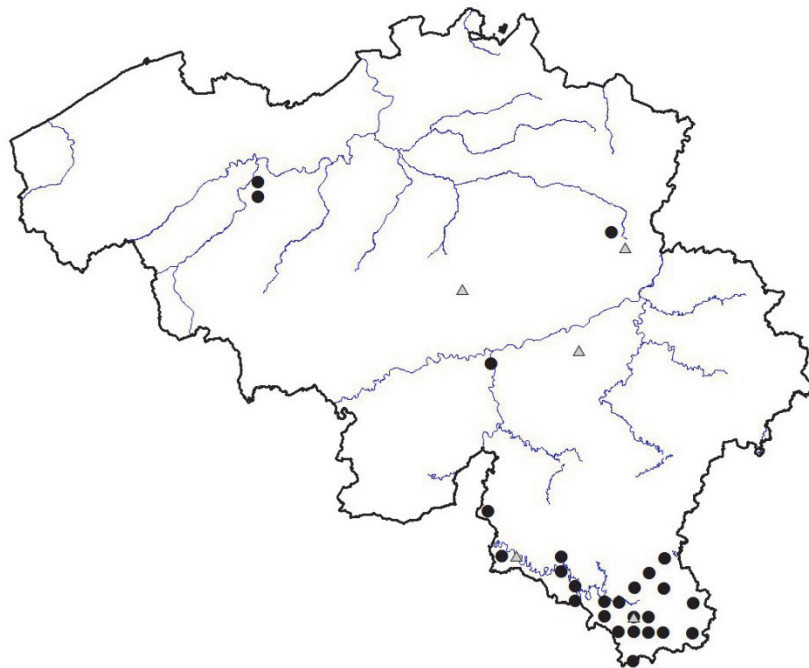
Additional Internet records : An additional locality for province of Limburg was found on a discussion forum on the internet (www.natuurfotoalbum.eu ; provided with photo) : Tongeren, De Kevie, July 2007. In 2013, another specimen was photographed here (7.VII.2013, Harry de Koning, posted with picture provided on the website www.waarnemingen.be). This locality is a nature reserve east of Tongeren on the Jeker, mostly with willows and poplars, and lies only 5 km from forest reserve Kolmont.

Liège province : 1♀, **Vierset Barse** (Modave ; needs to be confirmed), VII.78, Didier le Maire (GxABT).

Luxembourg province : 1♂, **Auby-sur-Semois**, IX.1924 (FGC) ; 1♀, same locality, VIII.1928, leg. L. Giltay (RBINS) ; 1♀, **Bébanze** (Messancy), 04.VIII.1997, Gillotin S. (GxABT) ; 1♀, **Buzenol**, 5.VIII.1936, leg. A. Soenen (RBINS) ; 1♂ & 1♀, Buzenol, vallée du Rabais, IX.1980, leg. A. Muylaert (RBINS) ; 1♀, Vallée du Rabais, 12.VII.1981 (MGC) ; 1 ex., forêt près de la **Chapelle Notre-Dame de Grâce**, route N40 Habay-la-Neuve vers Anlier, 16.VI.1988 (YTC) ; 3♂ & 2♀, **Chiny**, VI. 1908, R.I.Sc.N.B., I.G. : 17.207, coll. & det.



Distribution map for *Leptura aurulenta* in Belgium until 1980
(Verified data are provided in black circle and data obtained from internet, from the literature or still to be confirmed are presented in grey triangles).



Distribution map for *Leptura aurulenta* in Belgium until July 2013
(Verified data and resulting from direct observations are provided in black circle, and data obtained from internet, from the literature or still to be confirmed are presented in grey triangles).

L. Frennet (RBINS) ; 1♀, same locality and date, ex coll. E. Derenne (RBINS) ; 1♀, same locality, VIII.1911 (RBINS) ; 1♀, **Croix-Rouge**, Etalle, 20.VIII.1958, leg. E. Derenne (EDC) ; 9 exs, same locality, 6.VII.1977 (RDC) ; 2 exs, same locality, 17.VII.1978 (RDC) ; 1♀, same locality, Ex Larva, VII.[19]78, coll. Deledicque (MRC) ; 2 exs, **Croix-Rouge**, Sainte-Marie, 13.VII.1975, leg. G. Boosten (GBC) ; 1 ex., same locality, 25.VII.1976, leg. G. Boosten (GBC) ; 1 ex., **Fontenoille**, Fond Saulx, 14.VII.1976, leg. G. Boosten (GBC) ; 2♀, **Forêt d'Anlier**, 9.VII.2000, leg. F. Leduc (FLC) ; 1♀, same locality, 13.VI.2004, leg. F. Leduc (ADC) ; 2♀, **Forêt de Rulles**, La Vachière, 2004, leg. F. Leduc (ADC) ; 3♀, **Fouches**, "Lagland", Ex Larva from *Betula*,

11.VI.1978 coll. M. Rouard (MRC) ; 1♀, idem but 5.VII.1978 (MRC) ; 1♂, same locality, 16.VII.[19]78, coll. Deledicque (MRC) ; 2♀, **Gérouville**, 21.VII.1948, coll. E. Derenne (EDC) ; 1 ex., **Hachy**, 10.VII.1952, leg. J. Noël (GBC) ; 1♀, env. **Izel sur Semois** (Chiny), 26.VII.53, leg. V. Bierna, C. Verstraeten dt 69, coll. E. Taminiaux (GxABT) ; 1♂, **Lamorteau**, 12.VII.1954, coll. E. Derenne (EDC) ; 4♂ & 1♀, **Orval**, Villers-devant-Orval, 26.VII.1936, leg. & coll. E. Derenne (EDC) ; 1♀, same locality, 30.VII.1936 (RBINS) ; 1♂, same locality and date, det. E. Derenne, ex coll. G. Debatisse (MGC) ; 7♂ & 5♂, same locality and date, leg. & coll. E. Derenne (EDC) ; 1♂ & 1♀, same locality, 4.VII.1937 (RBINS) ; 1♀, same locality, 14.VII.1937, leg. & coll. E. Derenne (EDC) ; 1♂, same locality, 18.VII.1938, leg. & coll. E. Derenne (EDC) ; 1♀, same locality, 11.VII.1939, leg. & coll. E. Derenne (EDC) ; 1♀, same locality, 21.VII.1950, leg. & coll. E. Derenne (EDC) ; 1♀, same locality, 10.VIII.1950, leg. & coll. E. Derenne (EDC) ; 1♀, same locality, 21.VIII.1951, leg. & coll. E. Derenne (EDC) ; 1 ex., same locality, 14.VII.1960, leg. & coll. E. Derenne (EDC) ; 1 ex., same locality, 15.VII.1960, leg. & coll. E. Derenne (EDC) ; 1 ex., same locality, 24.VII.1960, leg. & coll. E. Derenne (EDC) ; 1♀, same locality, 6.VIII.1960, leg. & coll. E. Derenne (EDC) ; 1♀, **Prouvy**, 15.VIII.1951, coll. J. Leroux (JLC) ; 1 ex., **Saint-Léger**, 1956, leg. J. Noël (GBC) ; 1 ex., same locality, 24.VII.1971, leg. R. Bosmans (RBC) ; 1 ex., same locality, 28.VII.2002, leg. R. Grotz (RGC) ; 1♀, **Sainte-Cécile**, 17.VIII.1900, coll. Goetghebuer / UGMD 11119 (UGMD) ; 1♀, same locality, 15.VIII.1929 (FGC) ; 2♀, **Torgny**, 24.VII.1945, coll. E. Derenne (EDC) ; 1♀, same locality, 10.VIII.1953, coll. J. Leroux (JLC) ; 1 ex., same locality, 27.VII.1974, leg. G. Boosten (GBC) ; 1♀, same locality, 21.VII.2004, leg. & don P. Limbourg (I.G. : 30.388), à vue sur tronc de chêne (RBINS) ; 1 ex., **vallée de Laclaireau**, Ethe, 21.VII.1989, leg. P. Muret (PMC) ; 1♀, same locality, 21.VII.1991, leg. J.-M. Lempereur (ADC).

Direct observation : 1♀, env. **Mortehan** (Bertrix), VIII.2011, realised by M. Sion (specimen not collected, data provided with several photos).

Namur province : 1♀, **Mouzaive** (Vresse-sur-Semois), 10.VIII.1998, leg. G. Minet, C. Thirion det. 1999 (GxABT) ; 1♀, **Willerzie**, 26.VI.1998, leg. F. Leduc (FLC) ; 1♀, same locality, 2.VI.2001, leg. F. Leduc (ADC).

Direct observation : 1♀, **Namur**, Bois de la Basse Marlagne (Milieu du Monde), on trunk of *Quercus* sp., in forest fallow (coord. Lambert 1972 : X=183781 - Y=126362). Observation realised on 18.VII.2013 by Jean-Yves Bagnée (Observatoire de la Faune, de la Flore et des Habitats en Wallonie, DEMNA, Service Public de Wallonie, Gembloux, Belgium) (specimen not collected, data provided with a photo which is given in figure 7).

Additional localities which are given on cards conserved in GxABT : **Brabant wallon province** : **Tourinnes-St-Lambert** (Walhain ; needs to be confirmed), 22.IV.1984. **Luxembourg province** : **Vresse**, Alle, Prés des Douves, 17.VII.1984, coll. Halleux (Alle).

Ecology of the species and discussion concerning its distribution range extension

Leptura aurulenta is a polyphagous species, with a larval development in broadleaf trees (especially in *Fagus*, also in *Quercus*, *Castanea*, *Alnus*, *Betula*, *Juglans*, *Salix*, *Populus*, *Prunus*), probably also in conifers (*Pinus*). Larvae live in the dead wood of old stumps and roots, also in fallen trunks and branches and in dead parts of living trees. The life-cycle lasts several years, with pupation in the wood. Adults emerge in July and August, found on the host-plants and on flowers (PESARINI & SABBADINI, 1994 ; BENSE, 1995 ; SAMA, 2002 ; VINCENT, 2002). PLANET (1924) also reported that the development should occur in *Ulmus* trees.

In Belgium, it has been taken and bred (ex larva) from rotten birch wood (*Betula* sp) (ROUARD, 1980). Our findings in Bruinbos (Merelbeke) in 2009 prove that this species breeds also on wood that is already fairly decomposed (bark detaching, see Figs 5-6).

NIEHUIS (2001) links the presence of *Leptura aurulenta* to the presence of old beech forests. Its presence has also been suggested as an indicator of forests of international importance to nature conservation (SPEIGHT, 1989). In Germany it figures on the Red List (category 2 – endangered ; GEISER, 1998).

The localities in Merelbeke are separated by ca. 3 km from each other. Makegemse Bossen and Gentbos are public forests and managed in a way to conserve and promote dead wood. Castle park Blauwhuis is a privately owned park, conserving some very large trees and also at least one very large dead beech tree. Kolmontbos is a forest reserve with a high amount of dead wood. All these forests present good habitat for populations of *Leptura aurulenta*, which does not seem in immediate danger at the moment.



Fig. 5. *Leptura aurulenta* in copula : Merelbeke, Makegemse Bossen, Bruinbos, in copula on dead beech (*Fagus sylvatica*), 30.VI.2009 (photo by K. Smets).

Fig. 6. *Leptura aurulenta* female ovipositing : Merelbeke, Makegemse Bossen, Bruinbos, ovipositing on dead beech (*Fagus sylvatica*), 30.VI.2009 (photo by K. Smets).



Fig. 7. *Leptura aurulenta* female on trunk of *Quercus* sp. : Namur, Bois de la Basse Marlagne, in forest fallow, 18.VII.2013 (photo by J.-Y. Baugnée).

The localities Kwenenbos (Merelbeke) and De Kevie (east of Tongeren) need confirmation, since the specimens nor the localities were seen. However, thanks to the specimens from nearby forests Gentbos and Kolmontbos, these both seem possible records.

Two very doubtful localities, Vierset-Barse and Tourinnes-St-Lambert, need to be confirmed, as these are the result of didactical entomology collections from FSAGx, and the students who captured these specimens could not be retraced or interviewed. However, since the recent discoveries of *Leptura aurulenta* in a forest near Namur, and especially in Flanders, an even more unexpected region, these earlier and intermediate localities should become more easily accepted.

The first known Belgian capture is a female specimen from Sainte-Cécile, captured in August 1900 by Goetghebuer, and conserved in the collection of UGMD. A few years later, in 1908, 4 specimens were collected in nearby Chiny by Frennet (ANONYMOUS, 1909) : these are preserved in the collection of RBINS. In the GD of Luxembourg, *Leptura aurulenta* must have been present since at least 1892 (Echternacht, VIII.1892, coll. Guillaume in RBINS).

During 100 years, it was almost always found in the extreme south of Belgium (MUYLAERT, 1984). The recent findings of specimens of this species in several localities in Merelbeke, and one locality (possibly two) in Tongeren, seem to indicate that at least two populations exist in Flanders. The finding of a copulating pair and ovipositing female in Merelbeke, and the fact that the species has been observed there from 2007 to 2012, allow us to see this as a well-established population. The three individuals found in Kolmontbos, as well as the specimens from 2007 and 2013 in a nearby nature reserve, point to the same conclusion for Limburg.

The very recent observation of a female of *L. aurulenta* realised in July 2013 on a trunk of *Quercus* sp. in the forest “Bois de la Basse Marlagne” near Namur can then be considered as a very important discovery in this context.

The distribution of *Leptura aurulenta* can now be said to encompass several distant areas in Belgium where suitable old deciduous forests occur. The occurrence of this species in the northwest and the northeast of the country, as well as from the central part of Belgium, when it has always been known only from the southeast, is a very interesting phenomenon. There are several possible hypotheses concerning the new arrival of this species in the central and northern part of Belgium.

The first explanation is that it is extending its distribution area, possibly because of climate change. A supporting argument for this hypothesis is the fact that Kolmont forest reserve has been sampled with various traps for saproxylic beetles in 1999 (VERSTEIRT *et al.*, 2000). At that time, *L. aurulenta* was not found here. In 2001, *L. aurulenta* was also collected in Willerzie in Namur province which was a northern collect in comparison with the distribution provided by MUYLAERT (1984). NIEHUIS (2001) already suggested that the northern limit of this species is probably climate-controlled, since the host-plants occur also more to the north. He predicts that it could extend its range through climate change, especially in old beech forests in warm places. DEVICTOR *et al.* (2012) showed that temperatures in Europe rose by 1 degree over the last 20 years (1990-2008), shifting the isotherms approximately 250 km to the north. A certain delay between the thermal lag and the distribution range extension of *L. aurulenta* may have occurred, as was observed with birds and butterflies by these researchers. This hypothesis is also supported by recent findings in southern Belgium of other Cerambycidae species at a more northern part of their distribution (DRUMONT *et al.*, 2012a & b).

The second explanation is that it has always been overlooked, even with a large sampling campaign organised in the north. All forests sampled are old forests and/or forests with a high level of biodiversity. Bearing in mind that *L. aurulenta* is a species indicating good-quality forests (SPEIGHT, 1989), it could be possible that the species has always been present in these forests, albeit at population levels below the detection threshold. The recent forest management stimulating dead wood quantity and quality, as well as warmer climate, may have recently boosted populations in these forests to higher levels. This fact, combined with sampling campaigns, may have provided us with more or less simultaneous findings in Oost-Vlaanderen and Limburg. With an intensive sampling campaign (2010-2011) in Zoniënwood and Meerdaalwood however, *L. aurulenta* was not found (CREVECOEUR & KÖHLER, unpublished data).

As the species was never expected in more northern parts of Belgium, possibly some specimens exist in collections under *Leptura quadrifasciata* Linnaeus, 1758 (Figs 3-4). Especially males of *L. aurulenta* (Fig. 1) could easily be confused with males of *L. quadrifasciata* (Fig. 3). The front and basal margins of the pronotum of *Leptura aurulenta* have a typical fringe of dense, golden yellow

hairs that no other species has. In *L. aurulenta*, the antennae are black in the male and reddish-brown in the female (BENSE, 1995) (they are completely black in both sexes in *L. quadrifasciata*) and the legs are yellow-reddish with the base of the femorae more or less black (VILLIERS, 1978) (they are completely black in *L. quadrifasciata*). This combination of characters easily distinguishes *L. aurulenta* from the others species of European Lepturinae.

The fact that there are more females of *L. aurulenta* (Fig. 2) in Belgian collections could possibly be explained by the fact that the females are more striking than the males, and more easily recognized as something special and thus collected.

The authors would be grateful for any supplementary collection records of this species, to further document its distribution in Belgium.

Acknowledgements

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References

- ANONYMOUS, 1909. - Compte rendu de l'assemblée mensuelle du 4 septembre 1909. *Annales de la Société Entomologique de Belgique*, 53 : 405-406.
- ANONYMOUS, 1924. - Compte rendu de l'assemblée mensuelle du 6 décembre 1924. *Bulletin de la Société Entomologique de Belgique*, 6 (12) : 141-142.
- ANONYMOUS, 1974. - Compte rendu de l'assemblée mensuelle du 4 septembre 1974. *Bulletin et Annales de la Société Royale belge d'Entomologie*, 110 : 165-166.
- BAERT L., FASSOTTE C., GROOTAERT P., KEKENBOSCH J. & MUYLEAERT A., 1981. - Contribution à la connaissance de la faune aranéologique et entomologique de la région de Buzenol (Province de Luxembourg). *Bulletin I.R.Sc.N.B., Entomologie*, 53 (12) : 1-22.
- BAUMANN H., 1997. - *Die Bockkäfer (Coleoptera, Cerambycidae) des nördlichen Rheinlandes*. In : KÖHLER F. (Ed.) Beiträge zur Käferfauna und Koleopterologie im Rheinland. Festschrift zum siebenzigjährigen Bestehen der Arbeitsgemeinschaft Rheinischer Koleopterologen (1927-1997). Decheniana Beihefte (Bonn), 36 : 13-140.
- BENSE U., 1995. - *Longhorn beetles : Illustrated key to the Cerambycidae and Vesperidae of Europe*. Weikerheim, Margraf, 512 pp.
- BERGER P., 2012. - *Coléoptères Cerambycidae de la faune de France continentale et de Corse*. Association Roussillonnaise d'Entomologie, Perpignan, 663 pp.
- BÜSCHER N., 1994. - *Leptura aurulenta* F. *Entomo-Info*, 5(2) : 57-58.
- DELWAIDE M., 1998. - Récoltes intéressantes de coléoptères dans la région de Torgny. *Bulletin et Annales de la Société Royale belge d'Entomologie*, 134 : 261-269.
- DEVICTOR V., VAN SWAAY C., BRERETON T., BROTONS L. CHAMBERLAIN D., HELIÖLÄ J., HERRANDO S., JULLIARD R., KUUSSAARI M., LINDSTRÖM A., REIF J., ROY D.B., SCHWEIGER O., SETTELE J., STEFANESCU C., VAN STRIEN A., VAN TURNHOUT C., VERMOUZEK Z., DE VRIES M.W., WYNHOFF I., JIGUET F., 2012. - Differences in the climatic debts of birds and butterflies at a continental scale. *Nature Climate Change*, 2 : 121-124.
- DRUMONT A., CAMMAERTS R., VAN NUFFEL C. & NAVEZ P., 2012a. - *Cerambyx cerdo* Linnaeus, 1758 en Belgique (Coleoptera, Cerambycidae). *Lambillionea*, CXII (1) : 61-73.
- DRUMONT A., BAUGNÉE J.-Y. & MINET G., 2012b. - Note sur la présence en Belgique de *Tetrops starkii* Chevrolat, 1859 (Coleoptera, Cerambycidae, Lamiinae). *Lambillionea*, CXII (2) : 167-170.
- DU CHÂTENET G., 2000. - *Coléoptères phytophages d'Europe*. N.A.P. Editions, Vitry-sur-Seine, 359 pp.

- EVERTS E., 1903. - *Coleoptera Neerlandica. De schildvleugelige insecten van Nederland en het aangrenzend gebied. Tweede deel.* 's Gravenhage, Martinus Nijhoff, 796 pp.
- EVERTS E., 1922. - *Coleoptera Neerlandica. De schildvleugelige insecten van Nederland en het aangrenzend gebied. Derde deel.* 's Gravenhage, Martinus Nijhoff, 667 pp.
- FAYT P., DUFRÈNE M., BRANQUART E., HASTIR P., HENIN J.-M., LEJEUNE P., LHOIR J., PONTÉGNIE C. & VERSTEIRT V., 2006. - *Xylobios : a research project to study patterns, roles and determinants of wood-dependent species diversity in Belgian deciduous forests. Final report 2001-2005.* Brussels, Belgian Science Policy, 112 pp.
- FRENNET L., 1920. - Coléoptères du Jurassique Belge – Captures faites du 30 mai au 12 juin 1920. *Bulletin de la Société Entomologique de Belgique*, 2 : 101-103.
- GEISER R., 1998. – Rote Liste der Käfer (Coleoptera). In : BUNDESANHALT FÜR NATURSCHUTZ (Ed.), Rote Liste gefährdeter Tiere Deutschlands. BfN, Bonn-Bad Godesberg : 168-230.
- GEREND R., KÖHLER F. & BRAUNERT C., 2007. - Käfer – coléoptères – Coleoptera. Die Totholz Käfer (Coleoptera) des “Schnellert” bei Berdorf : ökologische Analyse der Xylobiontenfauna eines Altwaldes in der luxemburgischen Sandsteinlandschaft. In : MEYER & CARRIÈRES (Eds.), Inventaire de la biodiversité dans la forêt “Schnellert” (Commune de Berdorf). *Ferrantia*, 50 : 265-296.
- KÖHLER F., 2009. - Die Totholzkäfer (Coleoptera) des Naturwaldreservates “Laangmuer”. Untersuchungszeitraum 2007-2008. In : MURAT (Schriftl.), Naturwaldreservate in Luxemburg, Bd. 5. Zoologische und botanische Untersuchungen “Laangmuer” 2007-2008. Naturverwaltung Luxemburg : 48-115.
- KÖHLER F., CREVECOEUR L., & VANDEKERKHOVE K., 2011. - Saproxylid beetles of the Forest Reserve Kolmontbos. Results and analysis of a two-year survey. Report INBO.IR.2011.21. Instituut voor Natuur- en Bosonderzoek, Brussels, 49 pp.
- LAMEERE A. 1894. - Révision du catalogue des longicornes de la Belgique. *Annales de la Société Entomologique de Belgique*, 38 (6) : 294-309.
- LAMEERE A. 1900. - *Manuel de la faune de Belgique, Tome II, Insectes inférieurs.* Bruxelles, H. Lamertin, 857 pp.
- LEMPEREUR J.-M., DRUMONT A. & MURET P., 2000. - Contribution à l'étude de la faune entomologique de la Gaume : les Cerambycidae. *Lambillionea*, 100 (4) : 541-544.
- LIGERON J.-M., 2005. - *Catalogue des coléoptères des Ardennes françaises.* Société d'Histoire Naturelle des Ardennes, 103 pp.
- MATHIEU C., 1860. - Catalogue des Coléoptères de Belgique. *Annales de la Société Entomologique Belge*, 4 : 1-56.
- MATTER J., 1998. - *Catalogue et atlas des coléoptères d'Alsace. Tome I. Cerambycidae. 2^{ème} édition.* Société alsacienne d'entomologie. Musée zoologique de l'Université et de la ville de Strasbourg, 101 pp.
- MOUSSET A., 1973. - Atlas provisoire des insectes du Grand-Duché de Luxembourg. Coleoptera Cartes 227 à 445 (Hygrobiidae, Haliplidae, Dytiscidae, Gyrinidae, Scarabaeidae, Lucanidae, Cerambycidae). *Publication du Musée d'Histoire Naturelle et de l'Administration des Eaux et Forêts. Luxembourg.*
- MUYLAERT A., 1984. - Fauna van België. Boktorren (Cerambycidae). *Brussels, Royal Belgian Institute of Natural Sciences*, 147 pp.
- NIEHUIS M., 2001. - *Die Bockkäfer in Rheinland-Pfalz und im Saarland.* Landau, GNOR-Eigenverlag, 604 pp.
- PESARINI C. & SABBADINI A., 1994. - Insetti della Fauna Europea Coleotteri Cerambicidi. *Natura, Milano*, 85(1/2) : 128 pp.
- PICARD F., 1929. - *Coléoptères Cerambycidae. Faune de France, 20.* Paris, Lechevalier, 166 pp.
- PLANET L.-M., 1924. - *Histoire naturelle des Longicornes de France.* Encyclopédie Entomologique, Série A, II. Lechevalier, Paris, 386 pp.
- ROUARD M., 1980. Quelques Coléoptères de Belgique. I. Cerambycidae (Compte rendu de l'assemblée mensuelle du 13 janvier 1980). *Bulletin et Annales de la Société Royale belge d'Entomologie*, 116 : 9-10.
- SAMA G., 2002. - *Atlas of the Cerambycidae of Europe and the Mediterranean area. Volume I.* Nekladatelstvi Kabourek, Zlin, 173 pp.
- SAMA G. & LÖBL I., 2010. - Cerambycidae : Lepturinae. Catalogue of species [p. 104] In : LÖBL I. & SMETANA A. *Catalogue of Palaearctic Coleoptera, volume 6. Chrysomeloidea.* Eds Löbl I. & Smetana A., Apollo Books, Stenstrup, Denmark, 924 pp.
- SPEIGHT M.C.D., 1989. - *Saproxylid invertebrates and their conservation.* Nature and Environment Series, 42. Council of Europe, Strasbourg, 81 pp.
- TEUNISSEN A. P. J. A., 2009. - *Verspreidingatlas Nederlandse boktorren (Cerambycidae).* EIS-Nederland, Leiden, 127 pp.
- TWINN P.F.G. & HARDING P.T., 1999. - *Provisional atlas of the longhorn beetles (Coleoptera, Cerambycidae) of Britain.* Biological Records Centre, Huntingdon, 96 pp.

- VANDEKERKHOVE K., DE KEERSMAEKER L., WALLEYN R., KÖHLER F., CREVECOEUR L., GOVAERE L., THOMAS A. & VERHEYEN K., 2011. - Reappearance of old-growth elements in lowland woodlands in northern Belgium : do the associated species follow? *Silva Fennica*, 45(5) : 909–935.
- VERSTEIRT V., DESENDER K., GEUDENS G. & GROOTAERT P., 2000. - Determinatie en bioindicatie van bosgebonden ongewervelden. 3. Ecologische standplaatskarakterisatie van bossen aan de hand van keverfauna (Coleoptera). 4. Verkennend onderzoek naar de potentiële waarde van integrale bosreservaten voor het behoud van xylobionte arthropoden. *Brussel, KBIN*, 193 pp.
- VERSTRAETEN C., 1972. - Données pour un atlas des coléoptères de l'Europe occidentale. VI. Cerambycidae : Prioninae, Spondyliinae, Aseminae, Lepturinae. *Bulletin des Recherches Agronomiques de Gembloux, N.S.*, 7(1-4) : 314-332.
- VILLIERS A., 1978. - *Faune des Coléoptères de France 1 : Cerambycidae*. Encyclopédie entomologique, Lechevalier, Paris, 597 pp.
- VINCENT R., 2002. - Catalogue des Coléoptères du département de la Saône-et-Loire (F-71), complété par des recherches muséologiques, biographiques et bibliographiques sur les entomologistes bourguignons et leurs associations (1850-2005). Volume 1. *Terre Vive, Supplément Hors-Série du numéro 145* : 173 pp.
- VORST O. (Ed.), 2010. - *Catalogus van de Nederlandse kevers (Coleoptera). Monografieën van de Nederlandse Entomologische Vereniging, 11*. Nederlandse Entomologische Vereniging, Amsterdam, 317 pp.
- ZEEGERS T. & HEIJERMAN T., 2008. - *De Nederlandse boktorren (Cerambycidae)*. Entomologische tabellen, 2. Supplement bij Nederlandse Faunistische Medelingen. Nautilus, Leiden, 120 pp.

Internet references

- * www.natuurfotoalbum.eu, consulted July 2013
- * www.waarnemingen.be, consulted July 2013
- * <http://projects.biodiversity.be/beetles>. Species lists and distribution maps of saproxylic beetles, available online