

***Cis bilamellatus* (Wood, 1884) and *Xylographus bostrichoides* (Dufour, 1843), two new minute tree-fungus beetles for the Belgian fauna  
(Coleoptera: Ciidae)**

Kevin GIELEN

Olijftakstraat 20, B-2060 Antwerpen (e-mail: gielenkevin@hotmail.com)

**Abstract**

During a visit to De Duinbossen van De Haan at the Belgian coast, the fungivorous beetle *Cis bilamellatus* Wood, 1884 was discovered on 01.I.2017. While searching for more locations of *Cis bilamellatus* in western Flanders, another species *Xylographus bostrichoides* Mellié, 1847 was found in Veurne on 03.I.2018. Both species are reported here as a new for Belgium, *Xylographus bostrichoides* is also the first record of the genus for Belgium.

**Keywords:** new record for Belgium, Ciidae, fungivorous beetle, *Cis bilamellatus*, *Xylographus bostrichoides*

**Samenvatting**

Tijdens een bezoek aan De Duinbossen van De Haan aan de Belgische kust werd de fungivore kever *Cis bilamellatus* Wood, 1884 ontdekt op 1 januari 2017. Een jaar later werd tijdens een zoektocht naar andere locaties van *Cis bilamellatus* in West-Vlaanderen een andere soort, *Xylographus bostrichoides* Mellié, 1847, ontdekt in Veurne. Beide houtzwamkevers zijn nieuw voor België, de vondst van *Xylographus bostrichoides* is tevens de eerste vermelding van dit genus voor België.

**Résumé**

Lors d'une visite dans la forêt de dunes « Duinbossen » à De Haan sur la côte belge, le dendroctone fongivore *Cis bilamellatus* Wood, 1884 a été découvert le 1er janvier 2017. Un an plus tard, lors d'une recherche de l'espèce dans d'autres localités en Flandre occidentale, *Xylographus bostrichoides* Mellié, 1847, a été découverte à Furnes. Ces deux scolytes sont nouveaux pour la Belgique et le genre *Xylographus* est mentionné pour la première fois de Belgique.

**Introduction**

The Ciidae (Coleoptera) or minute tree-fungus beetles are a family of small obligate fungivorous beetles that complete their life cycle in polypore basidiomes. The family of the Ciidae remains understudied in Belgium, there is no definitive catalogue: different sources give different species numbers, and sometimes contain outdated taxonomic synonyms.

JELINEK (2008) lists 15 species in 5 genera for Belgium, while JELINEK & AUDISIO (2018) list 14 species, 2 of which are different. The Belgian online species list ([www.species.be](http://www.species.be)) gives 19 species in 5 genera for Belgium ([www.species.be](http://www.species.be)). In the Belgian province of Limburg, 18 species of Ciidae in 6 genera are known ([www.likona.be](http://www.likona.be)). Waarnemingen.be is an online data platform of Natuurpunt on which observations of Belgian species can be posted. It lists 18 species in 6 genera but contains only data for 14 species ([www.waarnemingen.be](http://www.waarnemingen.be)).

Combined, all these sources record a total of 23 species in 6 genera for Belgium. None of the consulted sources contain *Cis bilamellatus* or *Xylographus bostrichoides* as a record for Belgium. Both species were also absent from the Belgian collection of the Royal Belgian Institute of Natural Sciences. In this paper we give more details on these new records.

## Material and methods

De Duinbossen in De Haan form a 152ha large area that is divided in three parts. Forests are uncommon at the Belgian coast and two parts of De Duinbossen in De Haan are assigned forest reserve status because of their high natural value. The beetles were found in decaying fruiting bodies of *Inonotus radiatus* (Sowerby) P. Karst., 1881 (identified by Peter Van de Kerckhove and Roosmarijn Steeman from photographs, Fig. 1) on a standing dead trunk of *Alnus glutinosa* (diameter approximately 20 cm) at the eastern edge of De Duinbossen.

The cemetery Oud Kerkhof at the edge of the city Veurne is located 5,6 km from the Belgian coast. It dates from probably circa 1800 ([www.inventaris.onroerendergoed.be](http://www.inventaris.onroerendergoed.be)) and possesses a few old trees (*Aesculus hippocastanum* and *Fagus sylvatica*, Fig. 2), two of which had old fruiting bodies of *Ganoderma* sp (identified by Peter Van de Kerckhove from photographs); the *Aesculus hippocastanum* was cut down for safety reasons.



Fig. 1. *Inonotus radiatus* on *Alnus glutinosa* in De Duinbossen.



Fig. 2. The cemetery Oud Kerkhof in Veurne. Cut trunk of *Aesculus hippocastanum* in the foreground and *Fagus sylvatica* in the back.

Samples of the fungi (*Inonotus radiatus* from De Haan and *Ganoderma* sp from Veurne) were taken from the field in separate plastic bags. After a few days of drying, the fungi were searched by hand for beetles.

Identification of the collected beetles was made with the following keys: LOMPE (2002, based on LOHSE (1967)), HACKSTON (2017, based on JOY (1932) and LOMPE (2002)) and ROSE & ZAGATTI (2016).

The determination of *Cis bilamellatus* is easy due to the characteristic broad projections on the front of the head and pronotum in both male and female specimens (Fig. 3).

*Xylographus bostrichoides* (Fig. 4) can be distinguished from other Belgian Ciids by the denticulated protibia. Confusion with *Rhopalodontus perforatus* (Gyllenhal, 1813) is possible but in contrast to *R. perforatus* which also has a denticulated protibia, the apical portion of the protibia is not dilatated in *X. bostrichoides* and the denticules stretch along almost the whole side of the protibial length, while in *R. perforatus* only the apical dilatation of the protibia is denticulated (ROSE & ZAGATTI, 2016). Male specimens of *X. bostrichoides* are easily recognizable by the small horns on the head which are accentuated by tufts of long yellow hairs.

The characteristics of both species make confusion with other Ciidae occurring in Europe unlikely.

## Results

### MATERIAL EXAMINED:

#### *Cis bilamellatus*:

Four specimens collected on 01.I.2017 in De Duinbossen in De Haan (51.292235°N, 3.071993°E) in a predominantly pine forest, on a dead small Elder tree (*Alnus glutinosa*) in the undergrowth, in the decayed fruiting bodies of *Inonotus radiatus*. Of the four specimens two were severely damaged. Two intact male specimens were deposited in the collection of the Royal Belgian Institute of Natural Sciences (RBINS, IG: 33.954).

Specimens collected on 22.VII.2018 in Apigne France (48.094512°N, 1.745438°W). The specimens were found near the La vilaine canal on a stack of fire wood in *Ganoderma* sp. The specimens are deposited in the collection of Kevin Gielen.

#### *Xylographus bostrichoides*:

Five specimens (two male and three female) were collected on 03.I.2018 at the Oud Kerkhof cemetery in Veurne (51.074232°N, 2.665100°E). They were found either on an old *Fagus sylvaticus* tree and/or the trunk of an *Aesculus hippocastanum* tree. Since no distinction was made during collecting of the samples of *Ganoderma* sp. fruiting bodies of both trees, it is impossible to state the provenance of the samples more accurately. One male specimen is deposited in the collection of the RBINS (IG: 33.954) and three female and one male specimen in coll. K. Gielen (Antwerpen).

Specimens collected on 12.VIII.2018 in the Jardin des Plantes of Rouen (49.421099°N, 1.078267°E). The specimens were found on *Fagus sylvatica* in *Fomes formentarius*. The specimens are deposited in the collection of Kevin Gielen.



Fig. 3. One of the two intact male specimens of *Cis bilamellatus* found in De Haan (Picture Camille Locatelli).



Fig. 4. *Xylographus bostrichoides* male found in Veurne (Picture Camille Locatelli).

## Discussion

*Cis bilamellatus* is new for Belgium. It is an invasive species of Australasian descent and was first described new to science from specimens found in West Wickham near London in the UK by WOOD in 1884. In 1888 it was described separately from specimens collected in Port Lincoln (South Australia) as *C. munitus* Blackburn (BLACKBURN, 1888), synonymized with *C. bilamellatus* by CHAMPION (1910). It is presumed that the beetle was introduced in the UK via fungi samples for the Kew Gardens herbarium. Gradually the species has spread throughout Great Britain and it can now be found in England, Wales, the South of Scotland, the Isle of Man, the Channel Islands and the South of Ireland (ORLEDGE *et al.*, 2010). In 2005, it was found for the first time on the European mainland (Finistère, Bretagne, France; ORLEDGE *et al.*, 2010) and in 2009 in Plancoët, Côtes d'Armor (ROSE, 2012). Given its occurrence on the Channel Islands and Bretagne, it is not unlikely that the species is also present in Normandie. On 22.VII.2018 a further record for France of *Cis bilamellatus* was made in Apigne near Rennes.

In 2009 *Cis bilamellatus* was recorded in France on *Piptoporus betulinus* (ROSE, 2012) and in 2014 in Chile on *Ganoderma australe* (LOPES-ANDRADE & LÜER, 2014). In Great Britain, *Cis bilamellatus* has become one of the most abundant Ciid beetles. It achieves this high abundance through exploiting niche opportunities.

*Cis bilamellatus* has a very wide range of host fungi in Europe: *Laetiporus sulphureus*, *Piptoporus betulinus*, *Ganoderma applanatum*, *G. lucidum*, *G. resinaceum*, *Pseudoinonotus dryadeus*, *Bjerkandera adusta*, *Irpex sp.*, *Pleurotus cornucopiae*, *Polyporus squamosus*, *Trametes hirsuta* and *T. versicolor* (LOPES-ANDRADE & LÜER, 2014). In Great Britain, its favorite host fungus is *Piptoporus betulinus*. The dry fruiting bodies of this fungus are an underused niche in Great Britain, because of the absence of the Tenebrionid beetle *Diaperis boleti* (Linnaeus, 1758) which fills this niche in continental Europe. *Cis bilamellatus* occupies this vacant niche which native British Ciids cannot fill (PAVIOUR-SMITH 1968).

*Inonotus radiatus* is here mentioned for the first time as a host fungus for *Cis bilamellatus*.

*Xylographus bostrichoides* is new for Belgium and presents the first record of the genus *Xylographus* for Belgium. The distribution of *Xylographus bostrichoides* stretches from South-Central Asia over North-West Africa to South-Eastern and Central Europe (JELINEK, 2008). Recently the species is expanding its territory into North-Western Europe (Heetman, 2016), with recent findings in northern and western France (ROSE, 2012) and the Netherlands (HEETMAN, 2016). Its most northern European location (Denmark) remains uncertain (HEETMAN, 2016). On 12.VIII.2018 a further record for France of *Xylographus bostrichoides* was made in the Jardin des Plantes of Rouen. The specimens were found in the fruiting bodies of *Fomes formentarius* growing on a dead standing beech tree.

*Xylographus bostrichoides* is a thermophilic species and in Central and Western Europe it exclusively settles in lowlands. It favors *Fomes fomentarius* ((L.) Fr., 1849) as host fungus but can also develop in *Ganoderma* (P. Karst., 1881) species as is the case for the Belgian location and the sole locations in The Netherlands (HEETMAN, 2016) and Switzerland (REIBNITZ *et al.*, 2013).

### Suggestions for further research

As the discovery of 2 new species for Belgium resulting from a minimal collecting effort shows, the Belgian Ciidae are not well known. The study of this family is further hindered by the absence of a complete and up-to-date species catalogue of this family for Belgium. Different species lists exist, but none are complete. Compilation of these dispersed data should be a priority, together with study of the extant collection material: a superficial screening of the KBIN collection showed several misidentified specimens. Since the Belgian Ciidae fauna is clearly understudied and apparently in evolution, more inventories of this interesting family should be done in the whole of Belgium.

Concerning the invasive *Cis bilamellatus*, it would be interesting to investigate whether De Duinbossen in De Haan, its only known location in Belgium, is the starting point of an introduction or whether other new locations can be found on the south-western coast of Belgium or the north-eastern coast of France. Since De Haan is only 22 km removed from the border with the Netherlands, it could also be worthwhile to keep a lookout for *Cis bilamellatus* in Zeeuws-Vlaanderen.

The occurrence of *Xylographus bostrichoides* in Belgium was to be expected from its recent occurrences in the Netherlands (HEETMAN, 2016) well to the north of Belgium, and in France in the region North of Paris (ROSE, 2012). Both climate change and a greater abundance of its host fungi are mentioned as possible explanations for the recent expansion of *Xylographus bostrichoides* (HEETMAN, 2016). Remarkable is that the recent occurrences in Switzerland, the Netherlands and now also Belgium were all made on *Ganoderma* as host fungus. Is this a coincidence?

### Acknowledgements

I want to thank Peter Van de Kerckhove and Roosmarijn Steeman for identifying the host fungi from photographs, Wouter Dekoninck for giving me access to the collection of the RBINS and his guidance in writing this article, Koen Smets for his advice and above all for helping to battle my procrastination, and Camille Locatelli (RBINS) for the photographs of the specimens.

## References

- BELGISCHE SOORTENLIJST, 2018. - <http://www.species.be>. [accessed 5. I. 2018].
- BLACKBURN T., 1888. - Further Notes on Australian Coleoptera, with Descriptions of new Species. *Transactions and Proceedings and Report of the Royal Society of South Australia*, 10: 177-287.
- CHAMPION G.C., 1910. - *Cis bilamellatus*, Fowl., in Australia. *The Entomologist's Monthly Magazine*, 46: 70.
- HACKSTON M., 2017. - Mike's Insect keys.  
<https://sites.google.com/site/mikesinsectkeys/Home/keys-to-coleoptera/ciidae>. [accessed 5. I. 2018].
- HEETMAN A.J.A., 2016. - Alweer een nieuwe kever voor de Nederlandse fauna: *Xylographus bostrichoides* (Coleoptera: Ciidae). *Entomologische berichten*, 76(6): 209-212.
- JELINEK J., 2008. - Family Ciidae Leach, 1819, In: LOEBL I. & SMETANA A. (Eds.) - *Catalogue of Palaearctic Coleoptera, Vol. 5. Tenebrionoidea*. Apollo Books, Stenstrup, 55-62.
- JELINEK J. & AUDISIO A., 2018. - Fauna Europaea. <https://fauna-eu.org/>. [accessed 5.I.2018].
- JOY N.H., 1932. - *A practical handbook of British beetles*. Two volumes. H.F. & G. Witherby. Reprinted in slightly reduced format in 1976 by E.W. Classey Ltd, Faringdon.
- LIKONA, 2018. - Biodiversiteit Limburg. <http://www.biodiversiteitlimburg.be/atlas/>. [accessed 5. I. 2018].
- LOHSE G. A., 1967. - Familie: Cisidae. In: FREUDE H., HARDE K.W. & LOHSE G. A. (Eds.) - *Die Käfer Mitteleuropas, Band 7: Clavicornia*. Goecke und Evers, Krefeld, 280-295.
- LOMPE A., 2002. - Die Käfer Europas. Ein Bestimmungswerk im Internet.  
<http://coleo-net.de/coleo/texte/ciidae.htm>. [accessed 5.I.2018].
- LOPES-ANDRADE C. & LÜER A., 2014. - The Invasive Beetle *Cis bilamellatus* (Coleoptera: Ciidae) arrives in America. *Florida Entomologist*, 97(4): 1348-1352.
- NATUURPUNT, 2018. - Waarnemingen.be. <https://waarnemingen.be/>. [accessed 5.I.2018]
- ORLEDGE G.M., SMITH P.A. & REYNOLDS S.E., 2010. - The non-pest Australasian fungivore *Cis bilamellatus* Wood (Coleoptera: Ciidae) in northern Europe: spread dynamics, invasion success and ecological impact. *Biological Invasions*, 12 (3): 515-530.
- PAVIOUR-SMITH K., 1968. - A population study of *Cis bilamellatus* Wood (Coleoptera Ciidae). *Journal of Animal Ecology*, 37: 205-228.
- REIBNITZ, J., GRAF R. & CORAY A., 2013. - Verzeichnis der Ciidae (Coleoptera) der Schweiz mit Angaben zur Nomenklatur und Ökologie. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 86(1-2): 63-88.
- ROSE O., 2012. - Les Ciidae de la faune de France continentale et de Corse : mise à jour de la clé des genres et du catalogue des espèces (Coleoptera, Tenebrionoidea). *Bulletin de la Société entomologique de France*, 117(3) : 339-362.
- ROSE, O. & ZAGATTI P., 2016. - Les Ciidae de la faune de France continentale et de Corse : clé d'identification illustrée des espèces (Coleoptera Tenebrionoidea). *L'Entomologiste*, 72(5): 287-306.
- WOOD T., 1884. - A new species of *Cis*. *The Entomologist's monthly magazine*, 21: 130-131.