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First observations in Belgium of the introduced ‘minute hooded beetle’ *Arthrolips fasciata* (Erichson, 1842) (Coleoptera: Corylophidae)

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Abstract

In September 2020 a specimen of the Corylophidae *Arthrolips fasciata* (Erichson, 1842) was discovered in mushrooms on decaying beech in a garden in Sint-Denijs-Westrem. In October 2020 a second specimen of this species was discovered in Beisbroek Sint-Andries Bruges also on decaying beech. These are the first records of the species in Belgium. Hence, we expect more Belgian records of this species in the near future. A species list of the Corylophidae known to occur in Belgium is given.

Keywords: Coleoptera, Corylophidae, introduction, new record

Samenvatting

In september 2020 werd een specimen van de Corylophidae *Arthrolips fasciata* (Erichson, 1842) ontdekt in paddenstoelen op rottende beuk in een tuin in Sint-Denijs-Westrem. In oktober 2020 werd een tweede specimen van deze soort gevonden in Beisbroek, Sint-Andries Brugge ook op rottende beuk. Dit zijn de eerste waarnemingen van deze soort in België. We verwachten dan ook meer Belgische waarnemingen van deze soort in de nabije toekomst. Een lijst met alle in België voorkomende Corylophidae soorten wordt aangehaald.

Résumé

En septembre 2020, un spécimen de *Arthrolips fasciata* (Erichson, 1842) (Corylophidae) a été découvert dans des champignons associés à des hêtres en décomposition dans un jardin à Sint-Denijs-Westrem. En octobre 2020 un deuxième spécimen de cette espèce a été découvert à Beisbroek Sint-Andries Bruges aussi sur des hêtres en décomposition. Ce sont les premières données pour cette espèce en Belgique. Par conséquent, nous pouvons nous attendre à d'autres observations en Belgique dans un avenir proche. Une liste des espèces de Corylophidae connues pour être présentes en Belgique est donnée.

Introduction

A good method to add new species or discover rare species of insects for a certain region is to focus on families less studied, or to go and search near borders of other regions where these species have been found already. However, trying a different not often used sampling technique to collect this family might also be an option. Screening wood-decomposing fungi for beetles is a laborious but very interesting sampling technique. Recently, GIELEN (2018) discovered *Cis bilamellatus* Wood, 1884 and *Xylographus bostrichoides* (Dufour, 1843) two new minute tree-fungus beetles for the Belgian fauna when screening mushrooms. Besides Ciidae, also other rare species have been found in mushrooms last years like Zopheridae (TROUKENS, 2017), or in traps using mushrooms like Mycetophagidae (DRUMONT *et al.*, 2018).



Fig. 1a. Wood storage with decaying wood where the trunk of beech was located and in which *Arthrolips fasciata* was found in the garden of Vennestraat 6 in Sint-Denijs-Westrem.



Fig. 1b. Trunk of decaying beech wood colonized with two species of mushrooms: *Trametes ochracea* and *Cyanosporus subcaesius*.

During a screening of two species of fungi: *Trametes ochracea* (Pers.) Gilb. & Ryvarden and *Cyanosporus subcaesius* (A. David) B.K. Cui, L.L. Shen & Y.C. Dai on decaying beech (*Fagus sylvatica*) wood in a garden in Sint-Denijs-Westrem (Oost-Vlaanderen; Fig. 1a, b), and under the bark of a decaying beech in Beisbroek Sint-Andries near Bruges (West-Vlaanderen), besides several typical small Coleoptera living in fungi like Ciidae, a Corylophidae species new for Belgium was found: *Arthrolips fasciata*.

Material and methods

All specimens were collected during entomological excursions while searching insects under bark of dead wood colonised by fungi. Specimens were collected by hand and stored in 70 % alcohol. After identification using BOWESTEAD (2003) and LOMPE (2002) both specimens were mounted and stored in the collections of RBINS (Royal Belgian Institute of Natural Sciences) (deposit number IG 34.236). Taxonomy of all Corylophidae species mentioned is following BOWESTEAD (2007).



Fig. 2a. Lateral view of *Arthrolips fasciata* (Erichson, 1842) collected on 22/ix/2020 in Sint-Denijs-Westrem. © W Dekoninck.

Fig. 2b. Dorsal view of *Arthrolips fasciata* (Erichson, 1842) collected on 30/x/2020 under bark of a decaying beech in Beisbroek Sint-Andries near Bruges. © W Dekoninck.

Results

First records of *Arthrolips fasciata* in Belgium

MATERIAL EXAMINED: 1 specimen of *Arthrolips fasciata* (M. Van Kerckvoorde leg. & det.; Fig. 2a) found under the bark of decaying beech colonized with two species of fungi: *Trametes ochracea* and *Cyanosporus subcaesius* (Fig. 3) on 22/ix/2020 in the garden of Vennestraat 6 in Sint-Denijs-Westrem; 1 specimen of *Arthrolips fasciata* (W. Dekoninck leg. & det. Fig. 2b) on 30/x/2020 under bark of a decaying beech (Fig. 4) in Beisbroek Sint-Andries near Bruges.

RECORD IN SINT-DENIJS-WESTREM (UTM 1x1 KM SQUARE ES4653)

The beech trunk (Fig 1a, 1b) in Sint-Denijs-Westrem was already stored for several years in the garden. In the mushrooms also four species of Ciidae were discovered: *Cis boleti* (Scopoli

1763), *Cis micans* (Fabricius, 1792), *Octotemnus glabriculus* (Gyllenhal, 1827) and *Sulcacis fronticornis* (Panzer, 1805). Most of the fruit bodies (1 cm to 3 cm) of the two fungi species were completely eaten from the inside and from some fruit bodies almost nothing remained after colonisation by the Ciidae beetles.



Fig. 3. Fresh fruit bodies of *Cyanosporus subcaesius* on trunk of decaying beech.

RECORD IN BEISBROEK SINT-ANDRIES, BRUGES (UTM 1X1 KM SQUARE ES1068)

Next to the highway E40 (Brussels-Ostend) near Beisbroek in Sint-Andries a large number of beech trees in an avenue are dying since a few years. Most of the trees already lost a lot of their bark and many species of fungi are colonizing most of the trees. Five beeches were inspected and all observed Coleoptera were sampled with a pocket exhaustor. Under bark that partly came off the trees (see Fig. 4), besides *A. fasciata* also other Corylophidae were found: *Arthrolips obscura* Sahlberg, 1833 and *Sericoderus lateralis* (Gyllenhal, 1827). In the fungi on the trees some Ciidae were collected: *Ennearthron cornutum* Gyllenhal, 1827, *Cis boleti* (Scopoli, 1763) and *Sulcacis fronticornis* (Panzer, 1809). Especially *Arthrolips obscura* was found in very high numbers on almost every beech tree inspected.

A. fasciata is a brightly coloured small corylophid beetle of 1.16–1.3 mm long. It is bicoloured with a red-testaceous pronotum and its elytra are dark brown with a red-testaceous transverse wavy median band and pale apical margin. The head is dark and its antennae (11 segments) are dark with the basal segments slightly paler. The legs are pale throughout. It can hardly be confused with any other European Corylophidae species thanks to its characteristic colours. Further details on the description and designation of the lectotype can be found in BOWESTEAD (2003).



Fig. 4. Dead beech near E40 in Beisbroek Sint-Andries where *A. fasciata* was found under bark that partly came off the tree.

A recently arrived immigrant from Australia and New-Zealand

A. fasciata was originally described by ERICHSON in 1842 as *Corylophus fasciatus* from specimens collected in Tasmania. A few years later the same species was described as *Clypeaster pulchella* Lea, 1895 from New South Wales, Australia.

It was for the first time discovered outside Australia and Tasmania in 1996 when it was collected almost simultaneously in Gironde (DAUPHIN, 2004) and Dordogne (BOWESTEAD, 2003). Both authors also mention several other records from the southwest of France in the subsequent years. DAUPHIN (2004) suggested a possible expansion of this species in France and as such he encouraged entomologists to go searching for this species. Later PONET *et al.* (2010) completed the distribution of this species. They found *A. fasciata* in the southeast of France in the Département du Var (several specimens discovered in December 2006 by sieving of litter in a cork-oak forest) and in the Département des Alpes-Maritimes in October 2009 (1 specimen discovered under dehiscent bark of beech on 1400 m altitude). In 2008–2014 the species was found in 5 localities in Ariège (Pyrenees) (BOURDONNÉ & HOLLIGER, 2015). Later, BOUGET *et al.* (2019) confirmed that the species was widely established in the South of France.

After its first discovery in Europe in France, it was also recorded from Germany (see LOMPE, 2002) and from Italy by RATTI (2007), who reported the species from compost and even in caves in several localities in Venezia in 2000 and 2001 and one locality in Padova in 2002.

In 2010 and 2011 the species was reported from Girona in Spain (VIÑOLAS *et al.*, 2012). Coleonet (LOMPE, 2002) also mentions Madeira as locality. In 1989 *A. fasciata* has also been reported from United States of America, Florida, and in 1996 from Taiwan (THOMAS, 2005). Later on, it was also reported in US from Texas, Alabama and Virginia (see records on <https://bugguide.net/>).

The most recent new area where the species was discovered, is Russia, Western Caucasus where a specimen from the Krasnodar Territory (Dagomys environment) was sifted from rotten wood of an old fallen oak tree in July 2014 (KOVALEV, 2016).

Biology and Ecology

Corylophidae are thought to be mould feeders, being attracted to the fine moulds that occur on all vegetation as it decays (BOWESTEAD, 1999). Although it may be true that a particular corylophid species may feed in a variety of mould-ridden situations, it is important to have an understanding of the preferred habitats in which species may be expected to occur (BOWESTEAD, 1999).

When it was discovered for the first time in Europe it has been suggested that *A. fasciata* is associated in some way with conifers (BOWESTEAD, 2003) as the first specimens were discovered in pine forest. However later *A. fasciata* has been collected by sifting litter in a grove of cork oaks and under dehiscent bark of beech (PONET *et al.*, 2010), as well as in compost and even in caves (RATTI, 2007). In Russia a specimen from the Krasnodar Territory was sifted from rotten wood of an old fallen oak tree (KOVALEV, 2016). Most probably *A. fasciata*, like other Corylophidae species, is associated with moulds or other fungi, growing on various plant substrates, probably as well in humid artificial habitats, but also nearly undisturbed habitats. In the garden in Sint-Denijs-Westrem its discovery was linked with fungi in decaying beech wood, like was probably the case for some records in France.

Discussion

The finding of *A. fasciata* in a more northern locality than many of the other European records, indicates the species is expanding its distribution in Europe. As KOVALOV (2016) suggests this species is probably imported with planting material and why not might also be travelling with dead wood. Hence there is a great chance new records of this species will be discovered in the near future in Belgium and surrounding areas. In order to detect the species, we suggest to search in all kinds of decaying wood infected by fungi. To have a good chance to find the

species elsewhere in Belgium we suggest searching actively under bark and on surfaces of dead wood, or sieving of litter of bark and bracket fungi from standing and fallen trees. Samples (sieved or not in the field) can also be brought back to the lab and placed in a Winkler or other kind of funnel where the beetles can be extracted automatically when the samples dry out and beetles try to escape from the litter or bark or bracket fungi. Due to its rather large habitat range, we expect more Belgian records of this species in the near future.

CORYLOPHIDAE: A SMALL FAMILY OF COLEOPTERA WITH ONLY 11 SPECIES KNOWN FROM BELGIUM

Besides *Arthrolips fasciata* also other Corylophidae species are likely to be expected soon in Belgium as they are known from neighbouring countries (see BOWESTEAD, 2007) and knowledge on the Corylophidae family in Belgium is still very limited. This is probably due to a limited effort in the specific search for these small Coleoptera and also due to their small body size. BOWESTEAD (2007) only mentions 8 species to be present in Belgium (see Table 1).

Table 1. Species of Corylophidae known from Belgium according to BOWESTEAD (2007).

Species
<i>Sericoderus lateralis</i> (Gyllenhal, 1827)
<i>Corylophus cassidoides</i> (Marsham, 1802)
<i>Orthoperus corticalis</i> (Redtenbacher, 1845)
<i>Orthoperus atomus</i> (Gyllenhal, 1808)
<i>Orthoperus brunnipes</i> (Gyllenhal, 1808)
<i>Orthoperus nigrescens</i> Stephens, 1829
<i>Orthoperus atomarius</i> (Heer, 1841)
<i>Arthrolips picea</i> (Comolli, 1837)

In addition to the species mentioned in BOWESTEAD (2007), there are two other species recorded in Belgium so far: *Clypastraea pussilla* (Gyllenhal, 1810) and *Arthrolips obscura* (mentioned in this paper in high numbers from Beisbroek Bruges). *Arthrolips obscura* was found in five other localities in Belgium so far: i) Sonian Forest Hoeilaart, Groenendaal, Reserve Joseph Zwaenepoel, beech forest, 30/vi–02/viii/2010, leg. L. Crevecoeur & det. F. Köhler, on dead beech smeared with adhesive glue; ii) Grenspark Kalmthoutse Heide–Kraaienberg (Antwerpen) 28/viii/2013, 07/viii/2018 and 07/iv/2019, leg. & det. M. Lodewyckx, sifted out of sand, moss and sludge under bark of a dead beech; iii) Oudenaarde - Bos t'Ename–Wallebos (Oost-Vlaanderen) 12/iv/2015, leg. & det. Ph. Robben, during night catch on fungus; iv) Doeveren-Zedelgem (West-Vlaanderen) 27/xi/2020, leg. & det. W. Dekoninck & M. Van Kerckhoven, under bark of dead beech. v) Nethen, Grez Doiceau (Brabant wallon) 05/vii/2020, leg. & det. L. Dahan, on trunks of beech.

For *C. pussilla* there is one ancient record: “Pris une fois près de Bruxelles, par M. Parys” (MATHIEU, 1860). *Arthrolips fasciata* is the 11th Corylophidae species in Belgium.

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