First records of scoliid wasps in Belgium (Hymenoptera: Scoliidae)

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First records of scoliid wasps in Belgium (Hymenoptera: Scoliidae)

Fons Verheyde [1], Arno Thomaes [2], William Fiordaliso [3] & Sophie Genaux [4]

[1] Aartshertoginnestraat 58/01, 8400 Ostend, Belgium (corresponding author: fonsverheyde@hotmail.com)
[2] Research Institute for Nature and Forest (INBO), Havenlaan 88 bus 73, B-1000 Brussels, Belgium (e-mail: Arno.Thomaes@inbo.be)
[3] Laboratory of Interaction Ecology and Global Change, Laboratory of Zoology, Université de Mons, 6, Avenue du Champ de Mars, 7000 Mons, Belgium (e-mail: william.fiordaliso@umons.ac.be)
[4] Université de Mons, 6, Avenue du Champ de Mars, 7000 Mons, Belgium (e-mail: sophie.genaux@student.umons.ac.be)

Abstract

Three specimens of *Megascolia maculata* (Drury, 1773) were observed in Belgium from 2018 to 2022. These are the first certain reports of Scoliidae in Belgium. Migration, colonization and reproduction are discussed to explain these findings.

Keywords: Mammoth wasp, dagger wasps, species dispersal, Mediterranean Sea

Samenvatting

Tussen 2018 en 2022 werden drie reuzendolkwespen *Megascolia maculata* (Drury, 1773) waargenomen in België. Dit zijn de eerste zekere waarnemingen van dolkwespen (Scoliidae) in ons land. De verspreiding, migratie en voortplanting van deze diersoort wordt besproken om deze vondsten toe te lichten.

Resumé

Trois spécimens de *Megascolia maculata* (Drury, 1773) ont été observés en Belgique de 2018 à 2022. Il s'agit des premières occurrences certifiées de Scoliidae en Belgique. La migration, la colonisation et la reproduction sont discutées pour expliquer ces résultats.

Introduction

Scoliid or dagger wasps are impressive and colourful wasps, often observed on holidays near the Mediterranean Sea. Apart from their size and hairs, microscopic features can be used to distinguish the family. The wings have parallel wrinkles on the apical part. Furthermore, the first pair of coxae are touching while the middle and hind coxae are separated by the meso- and metasternum (Osten, 2000). Females are slightly more robust with 12 antennal segments and a somewhat hidden stinger, while males are more elongate and have 13 antennal segments (Richards, 1977). In contrast to other scoliid wasp genera such as *Scolia* spp., there are three cubital cells in the front wing (Osten, 2000) of *Megascolia* spp. Female dagger wasps are specialized on larvae of Scarabaeidae (Coleoptera). An adult female wasp oviposits its eggs on the larva, after paralysing it. The eggs hatch and, at least for some time, the wasp larva acts as an ectoparasite on the beetle larva (Scharfy, 2012; Dos Santos *et al*., 2015)

Worldwide, at least 560 species are known within Scoliidae (Osten, 2005). In northwestern continental Europe, a few species are native, or migrating naturally, but there are also species which are imported (see Discussion). So far, no species of Scoliidae have been observed in Belgium.

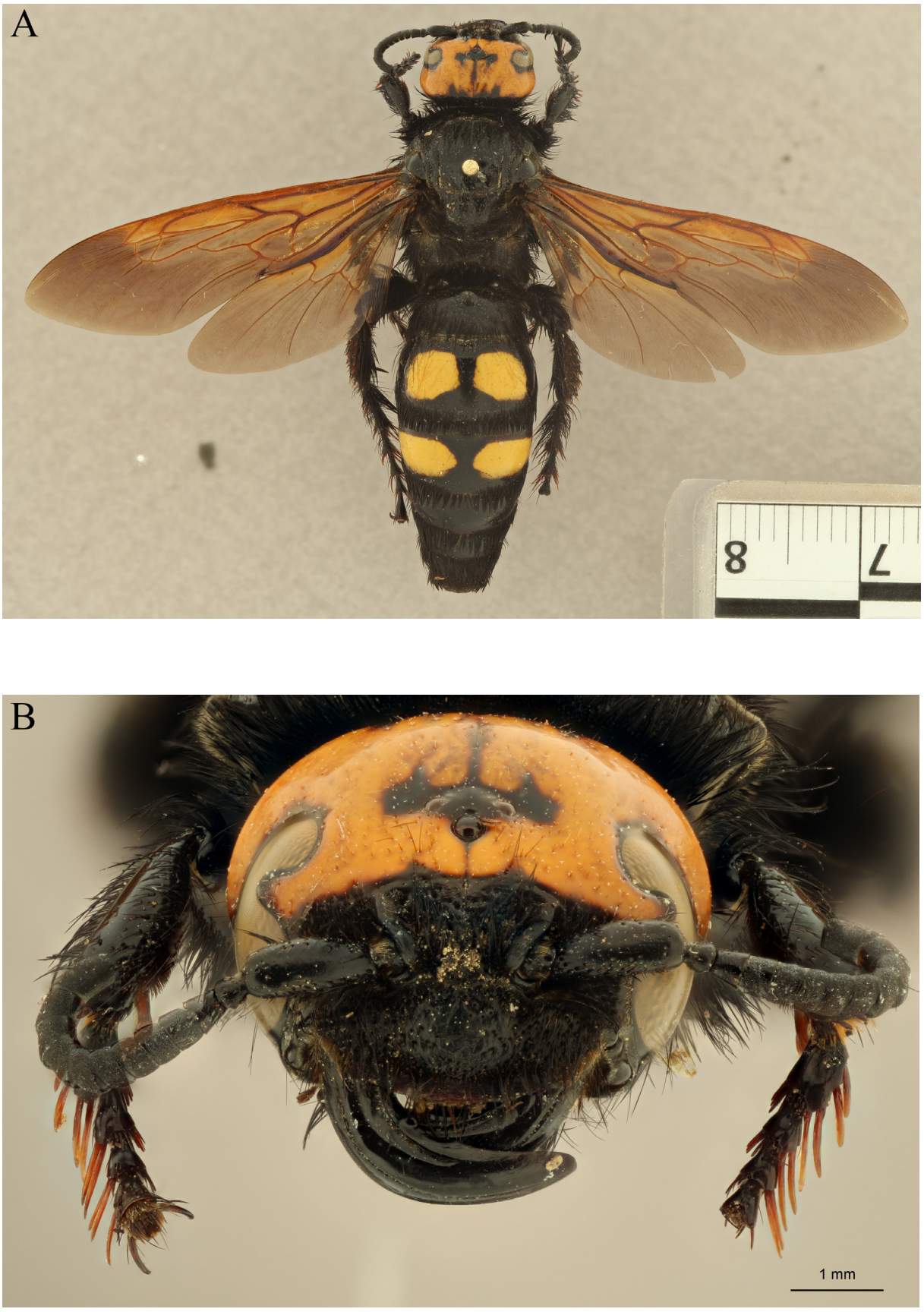

Fig. 1. *Megascolia maculata* (Drury, 1773), 13.VII.2022, leg. A. Thomaes. **A**, habitus. **B**, Frontal view. © RBINS.

Material and methods

The first specimen was found dead and registered on BDFGM (Banque de Données fauniques de Gembloux et Mons), where it is also kept in collection. The second specimen was found dead and reported on the citizen science portal waarnemingen.be. According to the reporter it was found on someone's terrace. The third specimen was observed foraging on artichoke flowers (*Cynara cardunculus*) and could be collected. It was donated to RBINS (Royal Belgian Institute of Natural Sciences).

Results

Megascolia maculata (Drury, 1773)
(Fig. 1A-B)

BELGIUM: • 1 ♀; Esneux; 50°32'44"N 5°34'13"E; 6.V.2018, S. Genaux leg.; field observation of dead specimen; coll. BDFGM; W. Fiordaliso det. • 1 ♀; Bellegem; 50°46'39"N 3°17'00"E (GPS is estimated); 26.VI.2022 (12:48), W. Steelandt leg.; field observation of dead specimen; F. Verheyde det. (ObsID: 246925145) • 1 ♀; Sint-Niklaas; 51°10'00"N 4°09'26"E; 13.VII.2022, A. Thomaes leg.; coll. RBINS; A. Thomaes & F. Verheyde det. (Figs. 1-2.; ObsID: 248914161)

M. maculata is one of the biggest Hymenoptera species in Europe, with a size of 32 to 42 mm (Fig. 1A). Just like the findings in the Netherlands (see below) our specimens belong to the former subspecies (now forma) *M. maculata flavifrons*. This forma has black hairs on the thorax (Figs 1A-B.) and last tergite (Schmid-Egger & Schmidt, 2021).

Discussion

The biggest question is of course the origin of these specimens. There is always some doubt on the provenance of certain individuals when we talk about migratory species. A species' ecology is important to establish whether individual specimens will be able to reproduce in the future; and we will be able to speak of established populations at some point.

Only recently both *Scolia hirta* (Schrank, 1781) and *Megascolia maculata* (Drury, 1773) were first reported for the Netherlands. It was concluded however only the first species could be seen as a natural migrant. The latter species was deemed to be imported, as it was found very close to a garden center and had undamaged wings (Verheyde *et al*., 2021). In our case however the conclusion is more difficult and there are important reasons to see at least one of our individuals (the one of Bellegem) as a potential natural migrant. First, the hosts are available (see below). Second, the climatic conditions were ideal, with higher temperatures on average at that moment (KMI). Third, the specimen was found dead on a terrace and not in great condition; which could be due to a long flight. Fourth, with a lower latitude our country is positioned more closely to endemic areas of the species in France and Germany. Fifth, the area of the southern part of West-Flanders is a known hotspot for thermophilic species of Hymenoptera. Some of them were already able to establish populations. Examples are *Euodynerus dantici* (Rossi, 1790) (Vespidae) and *Xylocopa violacea* Müller, 1776 (Apidae).

On the other hand, other known observations of migratory individuals are still quite southwards in France and Germany (GBIF; iNaturalist) – although, admittedly, observations are often not well reported in the northern regions of these countries. The closest observations at this moment are situated on approximately 500 kilometres. In comparison to the distribution of *Scolia hirta* (observed in the Netherlands, as mentioned above) this is a couple of hundred kilometres further. In the end, we cannot exclude with certainty that the specimens were imported and in that case

transport with (large) potted plants seems most likely. The observation in St-Niklaas is about 880 and 2700m away from two garden centres which sell large potted Mediterranean trees directly imported from southern Europe (see also Thomaes *et al*., 2022). In Bellegem and Esneux there is no garden centre nearby.

Known hosts of *M. maculata* are *Polyphylla fullo* (Linnaeus, 1758), *Oryctes nasicornis* (Linnaeus, 1758) and *Lucanus cervus* (Linnaeus, 1758) (Vereecken & Carrière, 2003). In Belgium, the first species occurs only in the coastal dunes but can be locally very common. *O. nasicornis* is a widespread species which is mainly found in compost heaps in gardens. As its larvae are also found in compost of industrial facilities, this host species is frequently transported (Thomaes *et al*., 2015). *O. nasicornis* is therefore known to be present in the direct surroundings of all three locations of *M. maculata* (waarnemingen.be). *L. cervus* is a species with a strongly limited distribution, especially in the north of Belgium and present only at Esneux (Thomaes *et al.*, 2015). Finally, as an experiment and to try to check reproduction, the female specimen caught in Sint-Niklaas was isolated with a larva (L3) of *Mecynorrhina torquata ugandensis*. No oviposition was observed.

Besides, the presence of potential host species, the specimen might also have been attracted to large blue/purple flowers (Landeck, 2002). In St-Niklaas the specimen was found on a flower of artichoke in an allotment garden with several blooming artichokes and sunflowers.

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One new and one rediscovered water beetle for Belgium (Coleoptera: Heteroceridae, Helophoridae)

Nobby Thys

Nieuwe prinsstraat 11, B-3012 Leuven (e-mail: Nobby.thys@scarlet.be)

Abstract

The discovery of a water beetle new for Belgium: *Augylus pruinosus* (Coleoptera, Heteroceridae) and two new records of a species that was not recorded from Belgium since 1965: *Helophorus longitarsis* (Coleoptera, Helophoridae) are discussed. These beetles were encountered during the preparation of a catalogue of the Belgian aquatic beetles.

Keywords: aquatic beetles, new species for Belgium, rediscovered species

Samenvatting

In deze publicatie bespreken we de vondst van een nieuwe waterkeversoort in België: *Augylus pruinosus* (Coleoptera, Heteroceridae) en van een soort die sinds 1965 uitgestorven gewaand was: *Helophorus longitarsis* (Coleoptera, Helophoridae). Deze kevers werden ontdekt tijdens een bemonsteringsproject ter voorbereiding van een Belgische cataloog voor aquatische kevers.

Résumé

Cet article décrit la découverte d'un coléoptère aquatique nouveau pour la Belgique : *Augylus pruinosus* (Coleoptera, Heteroceridae) et deux nouvelles observations d'une espèce qui n'avait plus été signalée en Belgique depuis plusieurs décennies : *Helophorus longitarsis* (Coleoptera, Helophoridae). Ces coléoptères ont été trouvés lors de la préparation d'un catalogue des coléoptères aquatiques belges.

Introduction

In order to publish a catalogue of the Belgian aquatic beetles, all Belgian records of the Coleoptera families have been compiled and verified since 2016. Large scale inventories as well as verification of the collection at Royal Belgian Institute of Natural Sciences and private collections as well as verification of records of these families on waarnemingen.be resulted in a database with more than 10.000 records of circa 370 species.

Doing so, a new species for the Belgian fauna was discovered and additionally new records came to light of another rare species of which recent records are lacking.

Material and methods

All records that are presented here were gathered during entomological excursions. Specimens were collected and identified using Drost *et al*. (1992) and Mascagni (2013).

Results

Family Heterocidae
Augyles pruinosus Kiesenwetter, 1851- **Belg. nov. sp**.
(Fig. 1A-B)

Material examined: 2 ♀♀, Rumst (prov. Antwerpen), Clay Quarry Wienerberger, 06/vi/2023; leg. Thys N., det. Thys N. & Mascagni A.; coll. Thys N.

This is a western Palaearctic species, distributed throughout most of Europe except Great Britain and Scandinavia, reaching Central Asia (Mascagni, 2006; Boukal *et al*., 2007). The species is known from France and Germany.

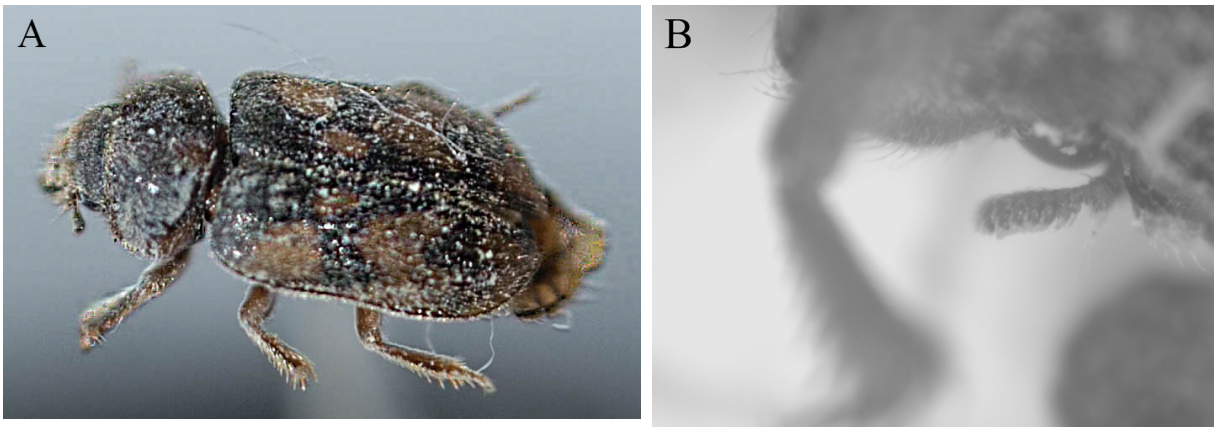

Fig 1. *Augyles pruinosus* Kiesenwetter, 1851. **A**, habitus, © Johan De Rycke. **B**, antennae, club. © Nobby Thys.

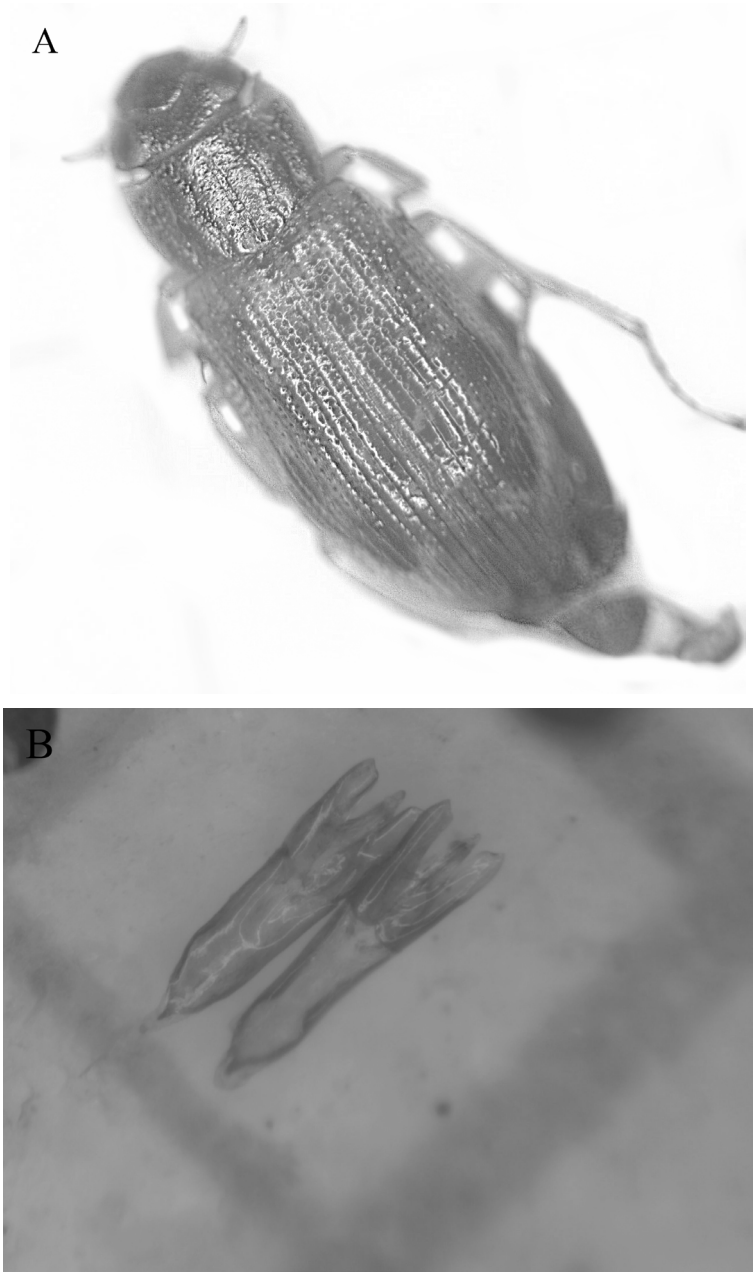

Fig 2. *Helophorus longitarsis* Wollaston, 1864. **A**, habitus. **B**, 2 male genitals. © Nobby Thys.

Range of occurrence includes mountains and excludes lowlands. It seems to prefer gravel on the soil (www.coleonet.de). Mascagni (2013) describes the habitat as sand at the edge of marshes, saltwater ponds and freshwater streams and rivers.

This species is found in an active clay quarry in Rumst (Antwerp). The habitat concerns open clay in the quarry, but the clay is sometimes removed till the level where sand is present.

Family Helophoridae
Helophorus longitarsis Wollaston, 1864
(Figs 2A-B, 3)

Material examined: 2 males, Kleine Vlakte, Knokke-Heist (prov. West-Flanders), 20/viii/2022, leg. det. & coll. Thys N.

This species is distributed from Spain, including the Canary Islands, and southern England across central Europe and the Mediterranean basin to southern Ukraine, Russia, Turkey, and northern Kazakhstan (Boukal *et al*., 2007; Przewoźny, 2022). The species is known from France, Germany and the Netherlands. It is found in Retranchement (pers. comm. Bas Drost), a Dutch location very close to the Belgium border.

The habitat in the 'Kleine Vlakte' are mainly ponds in grassland, closely located near 'Het Zwin'. The soil consists of a mixture of soils, but probably mainly clay.

The most recent Belgian record of this species dates from Torgny on 02/VII/1965. Its breeding habitat is clay or marl bottomed pools that are permanent enough to support this species in the summer (Foster *et al.,* 2014).

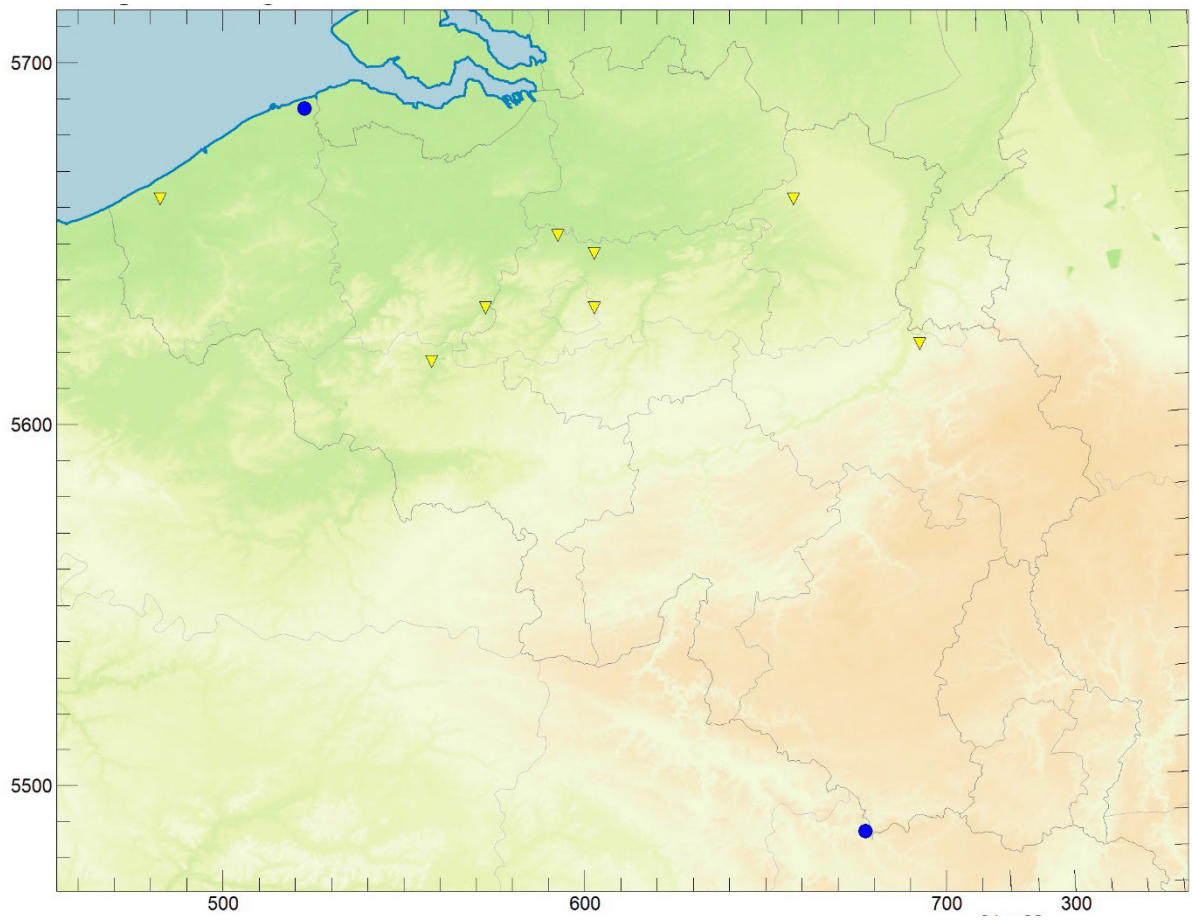

Fig. 3. Distribution of *H. longitarsus* in Belgium (blue dots: after 1950; yellow triangles: before 1950).

Acknowledgements

Thanks goes to Alessandro Mascagni for confirmation of *A. pruinosus* and Bas Drost and Pierre Queney for confirmation of *H. longitarsis*. Christine Petras kindly helped with permissions and field work in West-Flanders and Jorg Lambrechts (Natuurpunt Studie) arranged persmission and guided me in the quarry. Luc Crevecoeur made the distribution map. Johan De Rycke took pictures of *A. pruinosus*.

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