

Three new localities for *Gnorimus nobilis* in northern Belgium (Coleoptera: Cetoniidae)

Arno THOMAES¹, Alain DRUMONT², Senne EYLENBOSCH³, Hugo RAEMDONCK²,
David MULS⁴, Camille DEKUIJPER² & Loïc DAHAN²

¹ Research Institute for Nature and Forest (INBO), Kliniekstraat 25, B-1070 Brussel, Belgium
(e-mail: arno.thomaes@inbo.be)

² Royal Belgian Institute of Natural Sciences, Taxonomy and Phylogeny – Entomology, Vautier Street 29, B-1000 Brussel, Belgium

³ Sollenberg 3, B-1654 Huizingen, Belgium

⁴ Tuilstraat 15, B-1982 Elewijt, Belgium

Summary

Gnorimus nobilis (Linnaeus, 1758) was considered a common species all over Belgium in the beginning of the previous century. However, between 1970 and 2015 in northern Belgium, it was restricted to a single known population, in and near the Sonian forest, near Brussels. In this article we report three new localities for this species discovered in 2015 and 2016, i.e. Osbroek (Aalst), an orchard in Huizingen (Beersel) and the botanical garden Jean Massart (Auderghem). Finally, we discuss whether these observations are likely evidence of local populations and what could be the origin of these populations.

Keywords: Noble chafer, recolonisation, *Gnorimus nobilis*, new records, Belgium.

Résumé

Au début du siècle précédent, *Gnorimus nobilis* (Linnaeus, 1758) était considéré comme une espèce commune dans toute la Belgique. Par contre, entre 1970 et 2015, sa présence dans le nord de la Belgique s'est limitée à une seule population située dans et aux alentours de la forêt de Soignes, près de Bruxelles. Dans cet article, nous rapportons trois nouvelles localités: dans la réserve naturelle Het Osbroek (Aalst), dans un verger à Huizingen (Beersel) et au Jardin Botanique Jean Massart (Auderghem). Enfin, nous tentons de comprendre si ces observations confirment la présence de populations locales et quelle pourrait être, dans ce cas, l'origine de ces populations.

Samenvatting

Gnorimus nobilis (Linnaeus, 1758) werd in het begin van de vorige eeuw beschouwd als een algemene soort in heel België. Maar tussen 1970 en 2015, was de soort in noord België beperkt tot slechts een gekende populatie, in en nabij het Zoniënwood, nabij Brussel. In dit artikel melden wij drie nieuwe locaties voor deze soort die ontdekt werden in 2015 en 2016, nl. Osbroek (Aalst), een hoogstamboomgaard in Huizingen (Beersel) en de botanische tuin Jean Massart (Auderghem). Tenslotte, bespreken we of deze observaties duidelijk bewijs opleveren van lokale populaties en wat de origine van deze populaties zou kunnen zijn.

Introduction

With few exceptions, nearly all Cetoniidae were very rare in Flanders and the Brussels-Capital Region (further referred to as northern Belgium) at the end of previous century. Not only high demanding species like *Osmoderma eremita* (Scopoli, 1763) and *Gnorimus variabilis* (Linnaeus, 1758), but also *Cetonia aurata* (Linnaeus, 1761) and *Oxythyrea funesta* (Poda, 1761) went rare or extinct between

1950-1990 (JANSSENS, 1960; THOMAES *et al.*, 2015a, b, c; THOMAES *et al.*, 2016). However, the two latter species are now recolonizing Flanders (THOMAES *et al.*, 2015c; THOMAES *et al.*, 2016) and, concerning *C. aurata*, also the Brussels-capital region (TROUKENS, 2016).

Also *Gnorimus nobilis* (Linnaeus, 1758) followed a similar pattern. JANSSENS (1960) wrote that it was a common species all over Belgium and collection material from that time confirms this (Table 1; DRUMONT *et al.*, 2011; THOMAES *et al.*, 2015a). However, also this species has become rare in northern Belgium. Between 1970 and 2015, it has been found only 9 times (Table 1) and all records come from the Sonian forest and its surroundings. Consequently, it was concluded that there might be only one remaining population in northern Belgium and it was addressed to the red list category threatened with extinction in Flanders (THOMAES *et al.*, 2015c).

Table 1. Observations of *G. nobilis* in Flanders and Brussels-Capital Region ordered by province, including location, date, number of specimen (1 if not mentioned) and origin of the data: AF: Anne Fobert, FK: Frank Köhler, GABT: database of Gembloux Agro-Bio Tech (former University of Gembloux), GB: Guido Bonamie, GM: Geoffrey Miessen, MP: Patrick Muret, NmM: Natuurhistorisch museum Maastricht, RBINS: Royal Belgian Institute of Natural Science, UGhent: University of Ghent or literature, followed by the original collector.

Province Antwerpen - d'Anvers:

Antwerpen [Deurne (<1890, PREUDHOMME DE BORRE, 1891a); omgeving van Antwerpen (31.XII.1949, 6ex., RBINS: Dietz F.)]

Région Bruxelles capitale - Brussels Hoofdstedelijk Gewest:

Auderghem [(6.VII.1915, GABT: Van Dorselaer; 15.VI.1936, RBINS: Derenne E.); Rouge-Cloître (19.VII.1960, RBINS: Brabant R.); **Braine-l'Alleud** (7.VII.1896, RBINS: Polchet G.); **Bruxelles** [Elsene, Bois de la Cambre (<1890, PREUDHOMME DE BORRE, 1890; 16.VI.1976, MP); Laeken (<1890, PREUDHOMME DE BORRE, 1890)]; **Jette**, Dielegem (5.VI.1920, RBINS: De Buyst G. L.); **Watermael-Boitsfort** [Boitsfort (1.VI.1908, 2ex., RBINS: Frennet L.; 1.VII.1908, RBINS: Frennet L.; 10.VIII.1914, RBINS: Derenne E.; 6.VI.1915, 2ex., RBINS: Derenne E.; 17.VI.1915, 5ex., RBINS: Derenne E.; 26.VI.1916, RBINS: 10.VII.1916, RBINS: Frennet L.; 6.VII.1917, RBINS: Frennet L.; 15.VII.1918, 2ex., RBINS: Derenne E.; 10.VI.1940, RBINS: Guinez R.; 28.VI.1942, GABT: Van Dorselaer; 20.VI.1973, GM); Boitsfort, Sonian forest (1.VI.1940, RBINS: Guinez R., TROUKENS, 2008); Watermael (1.VI.1948, 8ex., RBINS: Frennet L.)]

Province Limburg – Limbourg:

Beringen [Paal (8.VII.1932, RBINS: de Ruelle R.); Beverlo (1.VI.1911, RBINS: Vreurick G.); **Hasselt** (<1890, PREUDHOMME DE BORRE, 1891b); **Kortesseem**, Vliermaalroot (<1890, PREUDHOMME DE BORRE, 1891b); **Tongeren**, Kolmont (21.V.1952, NmM)]

Province Oost-Vlaanderen - Flandre orientale:

Aalst, Moorsel (18.VI.1909, RBINS: Ball A.; 19.VII.1915, RBINS: Ball A.; 24.IV.1916, RBINS: Ball A.; 14.VII.1916, RBINS: 15.VII.1916, RBINS: Ball A.; 5.VI.1918, RBINS: Ball F. J.; 28.VI.1918, RBINS: Ball F. J.; 20.VI.1924, 2ex., RBINS: Ball J.); **Denderleeuw**, Welle (14.VI.1937, RBINS); **Evergem**, Sleidinge (1887, Ughent: Goetghebuer; 20.VI.1900, Ughent: Goetghebuer); **Geraardsbergen** (9.VI.1950, GB: Heynderycx J.); **Lierde**, Sint-Martens-Lierde (18.VI.1967, GB: Roels G.; 7.VII.1969, 2ex., GB: Roels G.; 25.VI.1963, GB: Roels G.); **Oudenaarde** [Eine (12.VI.1942, AF: Fobert L.); Leupegem (28.VI.1946, AF: Fobert L.)]

Province Vlaams-Brabant - Brabant Flamand:

Asse (1.VI.1937, 5ex., RBINS: Muller J.); **Beersel**, Alsemberg (1.V.1943, RBINS); **Halle** (31.XII.1949, 3ex., RBINS: Van Schepdael V.); **Hoeilaart** [Groenendaal (22.VII.1888, 3ex., RBINS: Guillaume F.; 31.VII.1909, RBINS: 27.V.1922, RBINS: Frennet L.; 18.VIII.1926, RBINS: Fagel G.; 13.VII.1937, RBINS: Havenith J.; 14.VII.1937, RBINS: Havenith J.); Sonian forest (22.VII.2013, Van der Donckt J.-F.); Sonian forest, Kerselaersplein (17.VI.2010, FK); Sonian forest, vijvers van Groenendaal (12.VII.1993, GM; 17.VI.2009, RBINS: Constant J. & Limbourg P.); **Kapelle-op-den-Bos**, Ramsdonk (30.VI.1887, RBINS: Havenith J.; 28.VI.1888, RBINS: Havenith J.; 1.VII.1888, RBINS: Havenith J.); **Kortenberg** (12.VI.1948, RBINS: Overlaet F. G.); **Opwijk** (4.VII.1876, RBINS); Sonian forest [(<1890, PREUDHOMME DE BORRE, 1890; V.1907, GABT: Van Dorselaer; 3.IV.1967, GABT: Thirion C.); Fond des Ails (3.VI.1995, MP; 26.VI.2001, MP); La Citadelle (20.VI.1973, 2ex., RBINS)]; **Tervuren** [(12.VII.1931, RBINS; 1935, RBINS: Allaer A.); **Vorst** (1.V.1938, RBINS: Mertens P.)]

G. nobilis might be considered as an intermediate demanding species. In many European regions, it is not as rare as *O. eremita* and *G. variabilis* but it is clearly rarer than *C. aurata*. Larvae of this species often inhabits hollow trees but it does not seem to be completely depending on hollow trees as they are also found in dead trees (JANSSENS, 1960; TAUZIN, 2004). In Wallonia, for example, this species is still found at various places (DRUMONT *et al.*, 2011; www.observations.be). Very recently, new records from this species for northern Belgium became available which are reported and discussed here.

Material and methods

Soon after the Flemish red list for this family was printed, one of the authors (SE) took a photo of a green metallic beetle in his garden (Sollenberg, Huizingen, 7.VI.2015). The pictures was later identified as *G. nobilis* by AT and DM (Fig. 1). At this location there is an old orchard and several pollarded trees that can serve as habitat of the species. No other specimen could be found in 2015 and 2016, despite it was actively looked for.

Secondly, AT found 3 specimens of *G. nobilis* in nature reserve Osbroek (Aalst) on 3.VI.2016 (Fig. 2). This 181 ha large site is protected as a Natura 2000 area and lies near the city center adjacent to the city park. It mainly contains alluvial forests dominated by alder (*Alnus glutinosa*) and former poplar (*Populus x canadensis*) plantations. A male and female were sitting on the same flower of a small elder bush (*Sambucus nigra*) while a second male was sitting on another flower of the same small bush. As the weather was rather cold and the vegetation was completely wet, the beetles were unable to fly away. The same day, many other elder bushes were investigated but no other *G. nobilis* could be found. One specimen was collected and is preserved in the collection of AT.

The third new locality is represented by the Jardin botanique Jean Massart which is a 5 ha large botanical garden located in the site Rouge Cloître, on the border of the Sonian Forest in the suburb town of Auderghem (Brussels-Capital Region). The garden, also a Natura 2000 site, was created in 1922 and conceived to represent a number of biotopes in Belgium and it globally remained as such since its creation. The garden is located in a valley and is surrounded by the Sonian forest in the North and the East side. One female specimen of *G. nobilis* (Fig. 3) was sampled from flowers of *Aruncus dioicus* (Walter) Fernald (Fig. 5) on 23.VI.2016, on a stormy day, during the “Objective 1000” network project. This project is aiming to inventory the insect fauna of the botanical garden and to record at least 1000 insect and spider species on the site. The beetle was collected and housed in the collections of the Royal Belgian Institute of Natural Sciences (RBINS).

A fourth possible location is published on www.waarnemingen.be. Sam & Katrien mention to have found a specimen in Huldenberg (Laanvallei, De Hoek, 4.VI.2016). But without a picture it is difficult to assess whether it is this species or *C. aurata* or *Anomala dubia* (Scopoli, 1763). Completely green variants of this last species are commonly mistaken for *G. nobilis* as many insect books depict a brown/green variant of *A. dubia*.

Distinctive characters between *Gnorimus nobilis* and *Cetonia aurata*

Despite the fact that these two green metallic flower beetles belongs to different subfamilies (Trichiinae for *G. nobilis* and Cetoniinae for *C. aurata*) of the Cetoniidae family, they are sometimes difficult to distinguish for the non-expert entomologists. We therefore underline the most representative differences existing on the habitus of the two species and list them on Table 2. Photos of female specimens of *G. nobilis* and *C. aurata* collected both in June-July 2016 in the Jardin Massart are also provided for comparison (Figs 3 & 4 respectively).

Results and discussion

The new data confirms that the species is present at three new locations. We believe that finding three individuals together is a good evidence of a local population. Certainly because Osbroek has quite a lot of dead wood (mainly of poplar) and some old pollarded trees. It also lies adjacent to the city park with old and likely several hollow trees. It is known to hold a good population of *C. aurata* and lies within the Dender valley which was first recolonised by *C. aurata*. Further, an historic population of *G. nobilis* is known from the castle park of Moorsel, Aalst (see Table 1) which is about 4 km of the current location.



Fig. 1. *G. nobilis* found in Huizingen (Beersel, 7.VI.2015, photo: S. Eylenbosch).



Fig. 2. *G. nobilis* found in Osbroek (Aalst, 3.VI.2016, photo: J. Mentens).



Fig. 3. *G. nobilis* female collected in Jardin Massart (Auderghem, 23.VI.2016, on flower of *Aruncus dioicus*, leg. Drumont A., Raemdonck H., Dahan L. & Dekuijper C., photo: C. Locatelli).

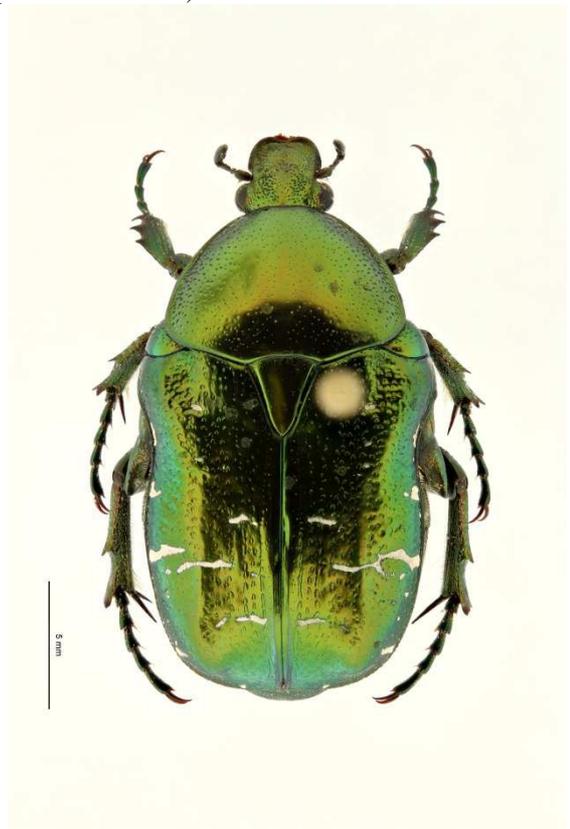


Fig. 4. *C. aurata* female collected in Jardin Massart (Auderghem, 6.VII.2016, on flower of *Astilbe sp.*, leg. Drumont A. & H., photo: C. Locatelli).

Table 2. Differences in habitus between *G. nobilis* and *C. aurata*.

<i>G. nobilis</i>	<i>C. aurata</i>
- body wide, rounded, with the wing cases revealing the abdomen (last part of the beetle)	- body more rectangular with parallel sides and with wing cases almost completely covering the abdomen
- pronotum narrower than abdomen, with rounded sides and bending back inwards at the base	- pronotum regularly expanding from the front to the rear and not bending inwards at the base
- mesothoracic epimera between pronotum and elytra not visible from above	- triangular plates (mesothoracic epimera) between the pronotum and elytra at the sides visible from above
- scutellum short, rounded and punctuated	- scutellum long, triangular and unpunctuated
- elytra without lateral notch	- elytra having a lateral notch allowing the wings to spread during the flight
- no bump at the ventral side between the middle legs	- rounded towbar-shaped bump (mesosternal process) at the ventral side between the middle legs



Fig. 5. Plant of *Aruncus dioicus* on which a specimen of *G. nobilis* was found on its flowers (Jardin massart, Auderghem, 23.VI.2016, photo: Th. Bruffaerts).

Interpreting the situation in Huizingen and Jardin Massart is, however, more difficult. Huizingen lies 6 km from the Sonian forest and Jardin Massart is adjacent to the Sonian forest. Therefore, a single migrating beetle from the known population in Sonian forest can still be considered as a possibility to explain the observation of a single beetle. However, the surrounding habitat seems suitable at both locations so it might as well represents a relic population or a recent recolonisation. Despite this species visits flowers, it remains an elusive species. Therefore, it is quite difficult to assess its status at these new locations. In the case of the Jardin Massart, the site was weekly sampled, by a team of 2-3 entomologists able to collect and recognize *G. nobilis*, in 2015-2016 from March to October and but less intensively in 2013-2014. Furthermore, 50 traps of various types were set-up on the site. Despite this intensive survey, only one specimen of *G. nobilis* was found, in contrast with *C. aurata* which was observed with about 15 specimens during the same period.

How the two other new locations have been colonized (if so) is uncertain. First of all it is not unlikely that we have overlooked relic populations of this species for several decades. This can be explained by its elusive behavior and the small number of entomologists that immediately would recognize this species. Therefore, small populations could have been overlooked easily and it is not impossible that more can be discovered. Especially at places where the habitat is again increasing like in the case of the Sonian forest, Jardin Massart and Osbroek special attention should be given to this species. This species is often considered as a typical inhabitant of old orchards, a habitat that might have been overlooked by entomologists in this region due to its private nature. It can be looked for when fruit trees are blossoming and maybe the specimen might be found more easily when conditions are not

good for flying as it was the case in Osbroek and Jardin Massart. Nevertheless, some 800 photos of *C. aurata* have been posted on www.waarnemingen.be and none of them have revealed *G. nobilis* in northern Belgium, showing that the species is at least quite rare. Another possibility is that this species is expanding since recent years and follows the footsteps of *C. aurata* and *O. funesta*. Also *C. aurata* and *O. funesta* followed river valleys when recolonizing this region (THOMAES *et al.*, 2015c; THOMAES *et al.*, 2016) what can at least fit with the findings in Osbroek.

Acknowledgments

The *G. nobilis* specimen found in Auderghem and presented in this paper is an output of the project “Objectif 1000”. This project deals with an inventory of the insects of the “Jardin botanique Jean Massart” sponsored by the Brussels Institute for the Environment (now called Brussels Environment). Therefore we thank especially Mrs Céline Fremault, Brussels Minister for the Environment, Mr Olivier Beck (project manager) and Mr Guy Rotsaert (permits). We are also indebted to the staff of the Jardin botanique Jean Massart, especially Mr Thierry Bruffaerts (responsible for Brussels Environment for the site) and Jean Vermander (Free University of Brussels) for the help and enthusiasm they placed in the project. We are very grateful to Ms Camille Locatelli (RBINS) for the stacked colour photos of the specimens collected in Jardin Massart en Jeroen Mentens for the picture of the specimen of Osbroek.

Finally, we want to thank Anne Fobert, Frank Köhler, Gembloux Agro-Bio Tech, Guido Bonamie, Geoffrey Miessen, Jean-François Van der Donckt, Patrick Muret, Natuurhistorisch museum Maastricht, Royal Belgian Institute of Natural Science and University of Ghent for the use of their data.

References

- DRUMONT A., KERKHOFF S. & GROOTAERT P. 2011. - Saproxylic beetles from Belgium, online distribution maps of species (Coleoptera). World Wide Web electronic publication (<http://projects.biodiversity.be/beetles/>)
- JANSSENS A., 1960. - *Insectes Coléoptères Lamellicornes – Faune de Belgique*. Institut Royal des Sciences Naturelles de Belgique, 411 pp.
- PREUDHOMME DE BORRE A., 1890. - *Matériaux pour la Faune Entomologique du Brabant: Coléoptères (cinquième centurie)*. Brussels, 34 pp.
- PREUDHOMME DE BORRE A., 1891a. - *Matériaux pour la Faune Entomologique de la province de Anvers: Coléoptères (quatrième centurie)*. Brussels, 58 pp.
- PREUDHOMME DE BORRE A., 1891b. *Matériaux pour la Faune Entomologique de la province de Limbourg: Coléoptères (quatrième centurie)*. Hasselt, 57 pp.
- TAUZIN P., 2004. - Quelques localités connues pour les espèces françaises d'*Aleurostictus* (Coleoptera, Cetoniidae, Trichiinae, Trichiini). *Cetoniimania*, 1: 33-52.
- THOMAES A., DRUMONT A., CRÈVECOEUR L. & DIRK M., 2015a. - Red list of the saproxylic scarab beetles (Coleoptera: Lucanidae, Cetoniidae and Dynastidae) for Flanders. *Bulletin de la Société royale belge d'Entomologie*, 151(3): 210-219.
- THOMAES A., DRUMONT A., CRÈVECOEUR L. & DIRK, M., 2015b. - Rode Lijst van de houtbewonende bladsprietkevers. *Natuur.focus*, 14 (3): 100-106.
- THOMAES A., DRUMONT A., CRÈVECOEUR L. & DIRK M., 2015c. - *Rode lijst van de saproxyle bladsprietkevers (Lucanidae, Cetoniidae en Dynastidae) in Vlaanderen*. Instituut voor Natuur- en Bosonderzoek, INBO.R.2015.7843021, Brussel, 49 pp.
- THOMAES A., RENNESON J-L., DRUMONT A. & DESCHEPPER C., 2016. - Range shift of *Oxythyrea funesta* Poda, 1761 (Coleoptera, Cetoniidae) in Belgium. *Lambillionea*, CXVI: 187-195.
- TROUKENS W., 2008. - Bijdrage tot een betere kennis van de verspreiding van onze inheemse bladsprietkevers (Coleoptera: Scarabaeoidea). *Phegea*, 36(3): 81-86
- TROUKENS W., 2016. - Twee nieuwe bladsprietkevers aan de westrand van Brussel (Coleoptera: Scarabaeoidea). *Phegea*, 44(2): 45-46.