Bulletin de la Société royale belge d'Entomologie/Bulletin van de Koninklijke Belgische Vereniging voor Entomologie, 153 (2017): 15–20

Donacia crassipes Fabricius, 1775 a rare or a neglected species in Belgium? (Coleoptera: Chrysomelidae: Donaciinae)

Kevin SCHEERS[1,2], Edward VERCRUYSSE[2], Vincent SMEEKENS[2] & Steven DE SAEGER[2]

[1] Corresponding author: aquatic.adephaga@gmail.com
[2] Research Institute for Nature and Forest (INBO), Kliniekstraat 25, 1070 Brussels, Belgium

Abstract

Donacia crassipes Fabricius, 1775 is an easily recognizable species of reed beetles (Donaciinae). The species is associated with Nymphaeaceae (both *Nymphaea* and *Nuphar* species). The species was not uncommon in Belgium until 1950, afterwards a notable decline was seen in the number of known records and from 1950 onwards only five records are known. A survey was carried out to assess the present status and distribution of the species in Belgium. 47 sites in the north of Belgium with stable populations of Nymphaeaceae were checked for the presence of *D. crassipes*. Of these sampled sites *D. crassipes* was present at 35 (74,5%) and thus the species seems currently not as rare as recent records indicated. This species was encountered for the first time in the province Limburg. Furthermore we present the first records of *D. crassipes* on non-indigenous water-lilies (*Nymphaea* cultivars).

Keywords: *Donacia crassipes*, *Donaciinae*, water beetle, reed beetle, Belgium, neglected species, Nymphaeaceae, water lilies

Samenvatting

Donacia crassipes Fabricius, 1775 is een relatief makkelijk herkenbaar riethaantje (Donaciinae). De soort is gebonden aan vegetaties van Nymphaeaceae (zowel *Nymphaea* en *Nuphar* soorten). De soort was niet zeldzaam in België voor 1950, daarna was er een opmerkelijke daling van het aantal vondsten en zijn er slechts vijf vondsten gekend. Een onderzoek werd uitgevoerd om de huidige status en verspreiding van de soort in België te evalueren. 47 locaties in het noorden van België met stabiele populaties van Nymphaeaceae, werden onderzocht op de aanwezigheid van *D. crassipes*. Van deze bemonsterde locaties was *D. crassipes* aanwezig in 35 (74,5%) en daarmee blijkt de soort momenteel niet zo zeldzaam te zijn als de schaarse recente vondsten aangegeven. Deze soort werd voor het eerst aangetroffen in de provincie Limburg. Verder melden we de eerste vondsten van *D. crassipes* op exotische waterlelies (*Nymphaea* cultivars).

Résumé

Donacia crassipes Fabricius, 1775 est une espèce de Donaciinae facilement reconnaissable. Elle est associée à des Nymphaeaceae (*Nymphaea* et *Nuphar*). En Belgique, cette espèce était commune jusqu'en 1950, ensuite, le nombre d'observations a fortement diminué et, à partir de 1950, seulement cinq occurrences ont été enregistrées. En 2016, une enquête a été réalisée afin d'évaluer la situation actuelle ainsi que la répartition de l'espèce en Belgique. Pour ce faire, 47 sites situés dans le nord de la Belgique et peuplés de populations stables de Nymphaeaceae ont été étudiés. *D. crassipes* a été relevé dans 35 des 47 sites prospectés (74,5%), il ne serait donc pas aussi rare que ce qui est dit

précédemment. Cette espèce a été rencontrée pour la première fois dans la province du Limbourg. En outre, nous présentons les premières observations de *D. crassipes* sur des nénuphars non-indigènes (*Nymphaea* cultivars).

Introduction

The subfamily Donaciinae is represented in Europe by three genera: *Donacia* Fabricius, 1775, *Plateumaris* Thomson, 1866 and *Macroplea* Samouelle, 1819. Of these genera, *Donacia* is the most species-rich in Belgium with 19 species (LAYS, 1997). *Donacia crassipes* Fabricius, 1775 (Fig. 1) is an easily recognizable species of Donaciinae. This species has disproportionately long hind legs with one or two teeth on the femora, a characteristic shared with *Donacia dentata* Hoppe, 1795 and *D. versicolorea* (Brahm, 1791). This species is however distinguished from these two latter species by the structure of the pronotum. The pronotum of *D. dentata* and *D. versicolorea* is strongly rugose and densely and coarsely punctured on the disc while the pronotum of *D. crassipes* is microsculptured throughout with fine grooves and has the disc with only a few very indistinct and fine punctures. The beetle usually has a dark metallic pronotum and elytra with a purplish, bluish, or coppery reflection but can be completely bright blue, green or coppery-red in some individuals. Like in most species of reed beetles there is a distinct sexual dimorphism in *D. crassipes*. The males are on average smaller than the females and have the femora of the hind legs more swollen and with two distinct teeth. The female has the hind femora more slender and less swollen, with only one tooth.

Fig. 1. *Donacia crassipes* Fabricius, 1775, adult on *Nuphar lutea* at the nature reserve Damvallei, Destelbergen, Oost-Vlaanderen, Belgium (Photo: E. Vercruysse).

Donacia crassipes is a widely distributed species occurring throughout most of Europe and reaching Kazakhstan in the east (SILFVERBERG, 2010). This species lives in lakes, ponds, wide ditches and slow flowing parts of rivers and is associated with Nymphaeaceae (in literature only *Nymphaea alba* L. and *Nuphar lutea* (L.) Sm. are named to species) on which both the adults and the larvae feed. The adults are active from the end of April till the beginning of September (BUKEJS, 2010; LAYS, 1997) and are found during daytime on the floating leaves of its host plant, mostly some distance from the banks to avoid predators. When approached they fly readily, staying low above the surface of the water and landing one or two meters further (like seen in species of the genus *Cicindela* Linnaeus, 1758 (Carabidae)). At night and during rainy days the adults probably take shelter on the stems and leaves under water (ASKEVOLD, 1988).

In Belgium, there are three indigenous species of Nymphaeaceae: *Nymphaea alba*, *N. candida* J. Presl and *Nuphar lutea*. The status of *N. candida* was unclear for a long time, but recent research confirms its specific status (KABÁTOVÁ *et al.*, 2014; DABROWSKA *et al.*, 2015). *Nymphaea alba* and *Nuphar lutea* occur in eutrophic and mesotrophic standing lakes, ponds, ditches and canals. In Belgium, these two species have a very similar distribution occuring mainly along the larger rivers in the north of Belgium and in the central part of the province of Limburg which is rich in lakes used for aquaculture. *Nymphaea candida* is a rare species in Belgium which is present with certainty from only a few nature reserves in the Campine region where it occurs in some clear oligotrophic lakes. Besides these indigenous species there are also a lot of sites where *Nymphaea* cultivars are present, a cultivated hybrid of Asiatic *Nymphaea* species. These *Nymphaea* cultivars are commonly used as garden plants in Belgium and are regularly introduced into the wild.
In former days *Donacia crassipes* was not uncommon in the north of Belgium. Since 1950, however, there are only five known records (LAYS, 1997; SCHEERS, unpublished data). The most recent published record is from 1985 in the province of Oost-Vlaanderen (LAYS, 1997) and there is also an unpublished record from 2015 in the south of the province of Luxembourg (which has been verified by the first author). The host plants are, however, still common in Belgium and a decline as indicated by the known records seems most unlikely. Therefore a survey was carried out with the scope to assess the present status of the species in Belgium.

Material and methods

Forty seven sites in the north of Belgium with populations of Nymphaeaceae were checked for the presence of *Donacia crassipes*. The locations where selected based on the following criteria: 1) presence of stable populations of Nymphaeaceae (present at the site for at least ten years), 2) accessibility and 3) geographical location (i.e. sites have to be scattered and cover a large region). Nymphaeaceae are the most common in the northern half of Belgium and especially along the more important river systems and thus inevitable most of the selected sites are within these regions (Fig. 2).
Each selected site was visited at least once and the floating leaves of *Nymphaea* sp. and *Nuphar* sp. were examined thoroughly with the aid of a binocular to ascertain the presence or absence of *D. crassipes*. In cases where the host plants where situated some distance from the banks waders were used (and in one case even a small boat) to check the floating leaves for adults of *D. crassipes*. If present, some specimens of *D. crassipes* where collected and afterwards deposited in the collection of the first author. From all sites the following characteristics where noted: area of the pond (in ha), presence of species of Nymphaeaceae and presence or absence of *Donacia crassipes* (Table 1). The fieldwork was carried out from 10.V.2016 till 01.VIII.2016 within the main period of activity of *D. crassipes*.

Results

A total of 47 sites where sampled during this survey, three in the province of West-Vlaanderen, 11 in Oost-Vlaanderen, 19 in Antwerpen and 14 in Limburg (Table 1, Fig. 3). *Donacia crassipes* was present at 35 of the 47 sampled sites, which corresponds to 74,5%. The species was found at several sites in the provinces Antwerpen, Limburg and Oost-Vlaanderen, but was not encountered in the province West-Vlaanderen. The area of the sites sampled range from less than 0,1 ha to 30 ha, with an median of 0,8 ha. At the sampled sites four species of Nymphaeaceae were present: *Nuphar lutea* (29 sites), *Nymphaea alba* (18 sites), *Nymphaea candida* (one site) and *Nymphaea* cultivars (6 sites). *D. crassipes* was found on *Nuphar lutea, Nymphaea alba* and *Nymphaea* cultivars but no populations were found at the one site with *Nymphaea candida*. There is no clear preference of the species for one of the host plants. There were both sites with and without *D. crassipes* of the different species of Nymphaeaceae (with exception of *Nymphaea candida*). As expected, if present, this species was most common at sites where their host plants *Nymphaea alba* or *Nuphar lutea* were dominant and covering a considerable area.

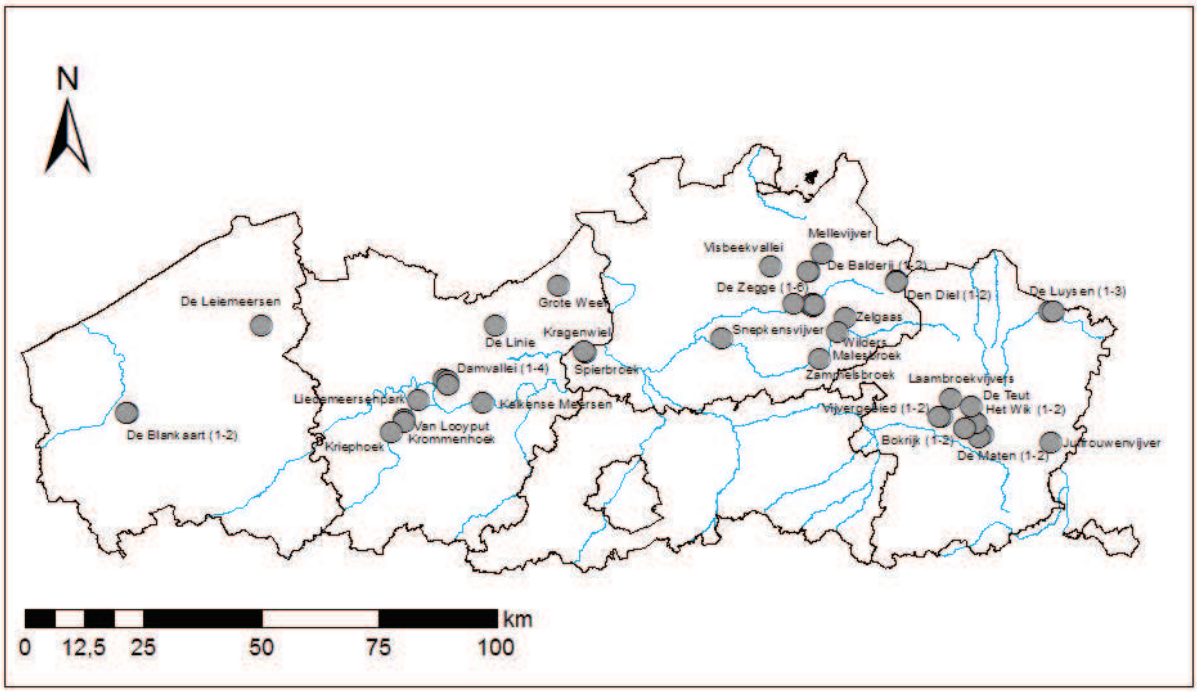

Fig. 2. Map of Flanders (northern half of Belgium) with the location of the sampled sites.

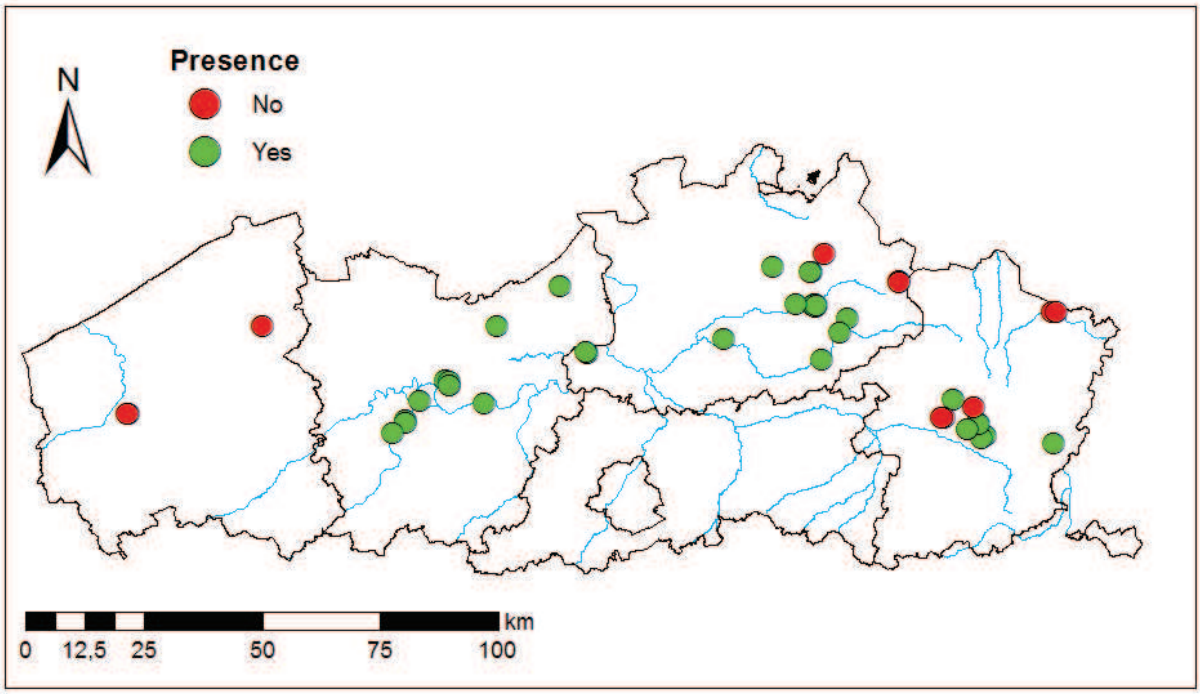

Fig. 3. Map of the sampled sites with indication of the presence of *D. crassipes* at the surveyed sites. (present: green dots n=35, absent: red dots n=12). On the background the provinces (black lines) and main rivers (blue).

Discussion and conclusion

The results show that *D. crassipes* is much more common than the previous records indicate. The species was present at 74,5% of the surveyed sites. The species was common in three of the four provinces included in this survey. The species was not encountered in the province West-Vlaanderen. In this province there were, however, only three sites visited and these are quite isolated from other sites with Nymphaeaceae. More sites in West-Vlaanderen have to be sampled to assess the status of the *D. crassipes* in this province. During this survey *D. crassipes* was encountered at eight sites in the province of Limburg, these are the first records of this province.

Table 1. Detailed account of the sampled locations. Nymphaeaceae: dominant = covering 25% or more, common = more than 10 individual plants but covering less than 25%, rare = less than 10 individual plants. Presence: *Donacia crassipes* present = Yes/No.

N°	Site	Province	latitude	longitude	Area (ha)	Nymphaeaceae	Presence
1	De Balderij (1)	Antwerpen	51,262	4,927	0,3	*Nuphar lutea* (common) and *Nymphaea alba* (common)	Yes
2	De Balderij (2)	Antwerpen	51,262	4,926	0,5	*Nuphar lutea* (common) and *Nymphaea alba* (common)	Yes
3	De Zegge (1)	Antwerpen	51,199	4,935	1,8	*Nuphar lutea* (common)	Yes
4	De Zegge (2)	Antwerpen	51,200	4,937	1,0	*Nuphar lutea* (common)	Yes
5	De Zegge (3)	Antwerpen	51,198	4,933	4,4	*Nuphar lutea* (common) and *Nymphaea alba* (common)	Yes
6	De Zegge (4)	Antwerpen	51,196	4,938	0,1	*Nuphar lutea* (common)	Yes
7	De Zegge (5)	Antwerpen	51,196	4,940	0,2	*Nymphaea alba* (common)	Yes
8	De Zegge (6)	Antwerpen	51,197	4,942	0,8	*Nuphar lutea* (common)	Yes
9	Den Diel (1)	Antwerpen	51,242	5,194	2,3	*Nymphaea alba* (common)	No
10	Den Diel (2)	Antwerpen	51,240	5,193	0,8	*Nymphaea alba* (common)	No
11	Kragenwiel	Antwerpen	51,108	4,247	3,9	*Nuphar lutea* (common)	Yes
12	Malesbroek	Antwerpen	51,145	5,013	1,6	*Nuphar lutea* (dominant)	Yes
13	Mellevijver	Antwerpen	51,295	4,968	28,1	*Nymphaea* cultivar (rare)	No
14	Snepkensvijver	Antwerpen	51,199	4,881	4,4	*Nuphar lutea* (common)	Yes
15	Spierbroek	Antwerpen	51,110	4,245	0,5	*Nuphar lutea* (dominant)	Yes
16	Visbeekvallei	Antwerpen	51,271	4,812	0,1	*Nuphar lutea* (common)	Yes
17	Wilders	Antwerpen	51,136	4,661	0,2	*Nuphar lutea* (common)	Yes
18	Zammelsbroek	Antwerpen	51,094	4,958	0,6	*Nymphaea* cultivar (common)	Yes
19	Zelgaas	Antwerpen	51,172	5,037	16,7	*Nuphar lutea* (dominant)	Yes
20	Bokrijk (1)	Limburg	50,959	5,392	2,2	*Nuphar lutea* (dominant)	Yes
21	Bokrijk (2)	Limburg	50,959	5,393	0,4	*Nuphar lutea* (dominant)	Yes
22	De Luysen (1)	Limburg	51,179	5,662	2,1	*Nymphaea alba* (common)	No
23	De Luysen (2)	Limburg	51,179	5,657	0,3	*Nymphaea* cultivar (common)	No
24	De Luysen (3)	Limburg	51,179	5,668	4,5	*Nymphaea alba* (common)	No
25	De Maten (1)	Limburg	50,947	5,449	3,0	*Nuphar lutea* (dominant) and *Nyphaea alba* (rare)	Yes
26	De Maten (2)	Limburg	50,943	5,436	1,5	*Nuphar lutea* (dominant)	Yes
27	De Teut	Limburg	51,002	5,415	1,8	*Nymphaea candida* (dominant)	No
28	Het Wik (1)	Limburg	50,972	5,426	2,1	*Nuphar lutea* (dominant)	Yes
29	Het Wik (2)	Limburg	50,970	5,428	3,7	*Nymphaea alba* (rare)	Yes
30	Juffrouwenvijver	Limburg	50,931	5,653	3,5	*Nymphaea alba* (common)	Yes
31	Laambroekvijvers	Limburg	51,017	5,350	3,0	*Nymphaea alba* (common)	Yes
32	Vijvergebied (1)	Limburg	50,981	5,322	0,2	*Nymphaea alba* (common)	No
33	Vijvergebied (2)	Limburg	50,982	5,316	0,2	*Nyphaea* cultivar (common)	No
34	Damvallei (1)	Oost-Vlaanderen	51,055	3,822	0,5	*Nuphar lutea* (dominant)	Yes
35	Damvallei (2)	Oost-Vlaanderen	51,053	3,832	0,8	*Nuphar lutea* (common)	Yes
36	Damvallei (3)	Oost-Vlaanderen	51,047	3,832	0,5	*Nymphaea* cultivar (common)	Yes
37	Damvallei (4)	Oost-Vlaanderen	51,047	3,834	0,4	*Nuphar lutea* (dominant) and *Nymphaea* cultivar (common)	Yes
38	De Linie	Oost-Vlaanderen	51,160	3,975	0,1	*Nymphaea alba* (rare)	Yes
39	Grote Weel	Oost-Vlaanderen	51,236	4,168	0,5	*Nuphar lutea* (dominant)	Yes
40	Kalkense Meersen	Oost-Vlaanderen	51,012	3,940	0,8	*Nymphaea alba* (common)	Yes
41	Kriephoek	Oost-Vlaanderen	50,955	3,663	3,5	*Nuphar lutea* (common)	Yes
42	Krommenhoek	Oost-Vlaanderen	50,975	3,701	0,5	*Nuphar lutea* (dominant) and *Nymphaea alba* (rare)	Yes
43	Liedemeerspark	Oost-Vlaanderen	51,016	3,745	0,8	*Nuphar lutea* (dominant)	Yes
44	Van Looyput	Oost-Vlaanderen	50,978	3,704	2,3	*Nuphar lutea* (common)	Yes
45	De Blankaart (1)	West-Vlaanderen	50,983	2,867	30,0	*Nuphar lutea* and *Nyphaea alba* (both dominant)	No
46	De Blankaart (2)	West-Vlaanderen	50,984	2,863	0,1	*Nymphaea alba* (rare)	No
47	De Leiemeersen	West-Vlaanderen	51,155	3,268	0,1	*Nuphar lutea* (common)	No

During this survey there where six sites sampled with *Nymphaea* cultivars. On three of these (of which two where *Nymphaea* cultivar was the only Nymphaeaceae present), *D. crassipes* was encountered. These are the first records of *D. crassipes* on a non-indigenous water lily. No populations were found on *Nymphaea candida*, however, there was only one site with this *Nymphaea* species included in this survey. There is no clear preference of the species for one of the host plants. There were both sites with and without *D. crassipes* of the different species of Nymphaeaceae (with exception of *Nymphaea candida*). Also was there no preference seen concerning the area of the site. The species was found at sites with an area ranging from less than 0,1 ha to more than 16,5 ha. The depth was not measured in this survey because the growing depth of *Nuphar* and *Nymphaea* species is rather constant, both intraspecific as interspecific.

The most important reason of the very low number of records of *D. crassipes* from 1950 onwards is the low intensity of entomological research in aquatic and semi-aquatic habitats and the fact that during that period no-person was specifically searching for Donaciinae in Belgium. Of all *Donacia* species, *D. crassipes* is one of the most elusive because it prefers places well out of reach in the open water. Because of this, most entomologist are not likely to encounter this species. The use of binoculars is the best way to detect this species and thus odonatologists are more likely to encounter this species than coleopterists. This survey shows that even a short-term species specific research can generate a good view on the status of this (and possible also other) species in the researched area. We believe that if a similar survey is carried out every ten years, with sites covering the whole of Flanders or Belgium, this species can easily be monitored.

Acknowledgements

The authors would like to thank an anonymous reviewer for reviewing an earlier version of the manuscript.

References

ASKEVOLD I., 1988. - The genus Neohaemonia Székessy in North America (CoIeoptera: Chrysomelidae: Donaciinae): systematics, reconstructed phylogeny, and geographic history. *Transactions of the American Entomological Society,* 113: 360–430.

BUKEJS A., 2010. - On Latvian Donaciinae Kirby, 1837 (Coleoptera: Chrysomelidae). *Acta Biologica Universitatis Daugavpiliensis,* 10 (2): 115–126.

DABROWSKA M.A., ROLA K., VOLKOVA P., SUDA J. & ZALEWSKA-GALOSZ J., 2015. - Genome size and phenotypic variation of Nymphaea (Nymphaeaceae) species from Eastern Europe and temperate Asia. *Acta Societatis Botanicorum Poloniae,* 84(2): 277–286.

KABÁTOVÁ K., VÍT P. & SUDA J., 2014. - Species boundaries and hybridization in central-European Nymphaea species inferred from genome size and morphometric data. *Preslia,* 86: 131–154.

LAYS P., 1997. - Les Donaciinae (Coleoptera: Chrysomelidae) de la faune de Belgique. Chronologie, phénologie et évaluation de la dérive faunique. *Notes fauniques de Gembloux,* 33: 67–143.

SILFVERBERG H., 2010. - *Donaciinae*. *In*: LÖBL I. & SMETANA A. (ed.): *Catalogue of Palaearctic Coleoptera*, Vol. 6. Stenstrup, Apollo Books, 354–359.