

## ***Hydrovatus clypealis* Sharp, 1876 expands its distribution to Belgium, with an update on the distribution of *H. cuspidatus* (Kunze, 1818) (Coleoptera: Dytiscidae)**

Kevin SCHEERS

Research Institute for Nature and Forest (INBO), Havenlaan 88 bus 73, 1000 Brussels, Belgium  
(e-mail: aquatic.adephaga@gmail.com)

### **Abstract**

In this article the first records of the water beetle *Hydrovatus clypealis* Sharp, 1876 for Belgium is presented and discussed. Additionally an update on the distribution of *Hydrovatus cuspidatus* (Kunze, 1818), an increasing species in Belgium, is provided. The characters by which to distinguish both species are mentioned and the distribution of these species in Belgium and Europe is mapped.

**Keywords:** Hydrovatini, Hydradephaga, increasing species, expanding distribution

### **Samenvatting**

In dit artikel worden de eerste vondsten van *Hydrovatus clypealis* Sharp, 1876 voor België gemeld en besproken. Tevens wordt een update gegeven van de verspreiding van *Hydrovatus cuspidatus* (Kunze, 1818), een recent toenemende soort in België. De kenmerken waarmee beide soorten kunnen worden onderscheiden worden vermeld en de verspreiding van deze soorten in België en Europa is in kaart gebracht.

### **Résumé**

Dans cet article, la première observation du coléoptère aquatique *Hydrovatus clypealis* Sharp, 1876 pour la Belgique est présentée et discutée. En outre, une mise à jour de la distribution de *Hydrovatus cuspidatus* (Kunze, 1818), une espèce en expansion en Belgique, est fournie. Les caractères distinctifs de ces deux espèces et leur carte de répartition en Belgique et en Europe sont donnés.

### **Introduction**

The genus *Hydrovatus* Motschulsky, 1853 is a large genus of rather small beetles which is most speciose in the tropics, especially in the Afrotropical and Oriental regions. This genus was revised in its entirety by BISTRÖM (1996), resulting in one of the largest works concerning one genus, and to date includes 212 described species (NILSSON & HÁJEK, 2017a). In Europe, the genus *Hydrovatus* is represented by two species, *H. clypealis* Sharp, 1876 and *H. cuspidatus* (Kunze, 1818) both of which have their main distribution in the south. *H. cuspidatus* has recently been expanding its range in Europe to the north (FOSTER *et al.*, 2016; IVERSEN *et al.*, 2011; NIEUKERKEN, 1979; PRZEWOZNY & BARLOZEK, 2008; SCHEERS, 2014 i.a.) and is now found as north as Denmark, southern Sweden and the north of Poland. *H. clypealis* has a more restricted distribution range and is confined to southwestern Europe and north Africa.

*Hydrovatus clypealis* was mentioned as Belgian in the 19<sup>th</sup> century by d'Orchymont (VAN DORSSELAER, 1957), but subsequent authors regarded this record as dubious and most probably the result of a misidentification of *H. cuspidatus* (VAN DORSSELAER, 1957; DOPAGNE, 1995; SCHEERS, 2012). More recent this species was, however, expected to occur in Belgium based on its recent occurrence in the vicinity of Dunkerque in northwestern France (Michaël Manuel pers. comm.



Fig. 1. Habitus of live specimens of A. *Hydrovatus clypealis* Sharp, 1876 (male) and B. *Hydrovatus cuspidatus* (Kunze, 1818) (male). Both specimens taken from the pond at Kampveld, Oostkamp, Belgium on 17.X.2017, Leg. K. Scheers. (Photo J. Soors).

VI.2017). Multiple efforts to find this species in ponds and marshes along the Belgian west coast were unsuccessful, despite the high potential of these habitats and the short distance to the population near Dunkerque. Finally, in September 2017 this species surprisingly turned up near Oostkamp (West-Vlaanderen) in an eutroficated pond of fairly recent origin and confirmed as a new species for the Belgian fauna.

*Hydrovatus cuspidatus* was always considered to be a very rare species in Belgium (VAN DORSELAER, 1957) and there are only few records known of this species until 2000 (SCHEERS, 2014). From 2000 onwards this species has known an exponential increase in both number of records and area of distribution in northern Belgium, probably as result of more suitable climatic conditions in more recent years (SCHEERS, 2014). A similar increase is reported in The Netherlands (NIEUKERKEN, 1979) and also in Great Britain this species seems to be increasing (FOSTER *et al.*, 2016). A recent distribution map of this species in Belgium was provided by SCHEERS (2014), but since then many new records have resulted in a more even distribution and better coverage throughout the northern half of Belgium (Flanders) and the first record from the Walloon region in the south.

*Hydrovatus clypealis* and *H. cuspidatus* (Fig. 1) have the same rounded and dorsally somewhat flattened bodyshape. The former is recognizable by 1) having no distinct lighter colored markings on the elytra (in some live specimens there is however a poorly delimited color pattern similar to that of *H. cuspidatus*), 2) the clypeus truncated in the males while rounded in females, 3) the first and second sternites with a series of small longitudinal scratches, without scattered larger punctures and 4) the male genitalia with the apex rather straight, not distinctly hooked. *H. cuspidatus* has 1) typically lighter markings on the elytra, 2) the clypeus rounded in both sexes, 3) the first and second sternites with larger punctures and 4) the aedeagus of the male genitalia distinctly hooked near the apex. Furthermore *H. clypealis* is slightly smaller and more elongated than *H. cuspidatus*.

## Results

### First record of *Hydrovatus clypealis* Sharp, 1876 for Belgium

MATERIAL EXAMINED. 4♂♂ & 3♀♀ (one male with genitalia dissected), 26.IX.2017, Kampveld, Oostkamp, West-Vlaanderen, Belgium, 51°07'21.6"N 3°15'07.9"E; eutroficated pond in meadow; 1♂ & 1♀, 04.X.2017, same locality: 4♂♂ & 3♀♀, 17.X.2017 same locality. All leg. & det. K. Scheers. One male and one female are deposited in the collection of the Royal Belgian Institute of Natural Sciences (RBINS, I.G.: 33.591), all other specimens are deposited in the private collection of the author.

The pond in which *H. clypealis* was found is a medium sized, partly shaded, eutroficated pond on a soil of loamy sand (Fig. 2). The surface of the pond was completely covered with duckweeds but the water underneath was clear and not turbid but slightly coloured due humic acids. The pH was low (5.6), with a low conductivity (81.4  $\mu\text{S}/\text{cm}^{-1}$ ). The level of dissolved oxygen is very low (0.90  $\text{mg}/\text{L}^{-1}$  with saturation 8.6%), probably as result of the abundance of duckweeds (during sampling on 04.X.2017). All specimens were found near the edge of the pond between mats of *Hottonia palustris* L. at the base of common bulrush *Typha latifolia* L. At this site the species was found together with the Noteridae *Noterus clavicornis* (De Geer, 1774) and the Dytiscidae *Graptodytes bilineatus* (Sturm, 1835), *G. pictus* (Fabricius, 1787), *Hydroporus angustatus* Sturm, 1835, *H. palustris* (Linnaeus, 1760), *H. planus* (Fabricius, 1782), *H. pubescens* (Gyllenhal, 1808), *H. tessellatus* (Drapiez, 1819), *Hydrovatus cuspidatus*, *Hygrotus inaequalis* (Fabricius, 1777), *Agabus bipustulatus* (Linnaeus, 1767) and *Ilybius chalconatus* (Panzer, 1796). These are all more or less common species in this region, many of which are eurytopic species and have a relatively high tolerance to eutrofication.



Fig. 2. Pond at Kampveld, Oostkamp, Belgium, at present the only know Belgian site with *Hydrovatus clypealis*. (Photo K. Scheers).

In the Iberian peninsula and south-west France this species is common in different kinds of lentic habitats, both temporary and permanent, in the lowlands and foothills with a muddy bottom and at least some vegetation of helophytes. As it goes to the north it's more or less restricted to the coastal regions which indicates a climate driven distribution. (FOSTER & FRIDAY, 2011; FOSTER *et al.*, 2016) mention *H. clypealis* from muddy ponds and ditches with marginal vegetation and in ponds with floating rafts of *Hypericum elodes* L. Furthermore FOSTER *et al.* (2016) note that this species is, in contrast to *H. cuspidatus*, is rarely found in brackish water.

*Hydrovatus clypealis* is a West-Mediterranean species ranging from Algeria, Egypt, Morocco and Tunisia in north Africa trough the Iberian peninsula along the Atlantic and western Mediterranean coast of France to southern England, Wales, Ireland (FOSTER *et al.*, 2016; NILSSON & HÁJEK, 2017b) and now also Belgium. The species is also known from the Balearic islands, Corsica, Sardinia and a small area at the coast of mainland Italy (FRANSISCOLO, 1979; MILLÁN, 2014) (Fig. 3 A). NILSSON & HÁJEK (2017b) also include Croatia and Serbia in the distribution of this species based on old literature records listed in GUÉORGUIEV (1971). FRANSISCOLO (1979), however, mentions that the record of *H. clypealis* in Croatia (Dalmatia) needs to be verified. Based on the distribution as known to date (Fig. 3 A), the presence of this species in Croatia and Serbia, although not impossible, seem indeed less probable. At present this species is only known from one site in the North-West of Belgium (Fig. 4).

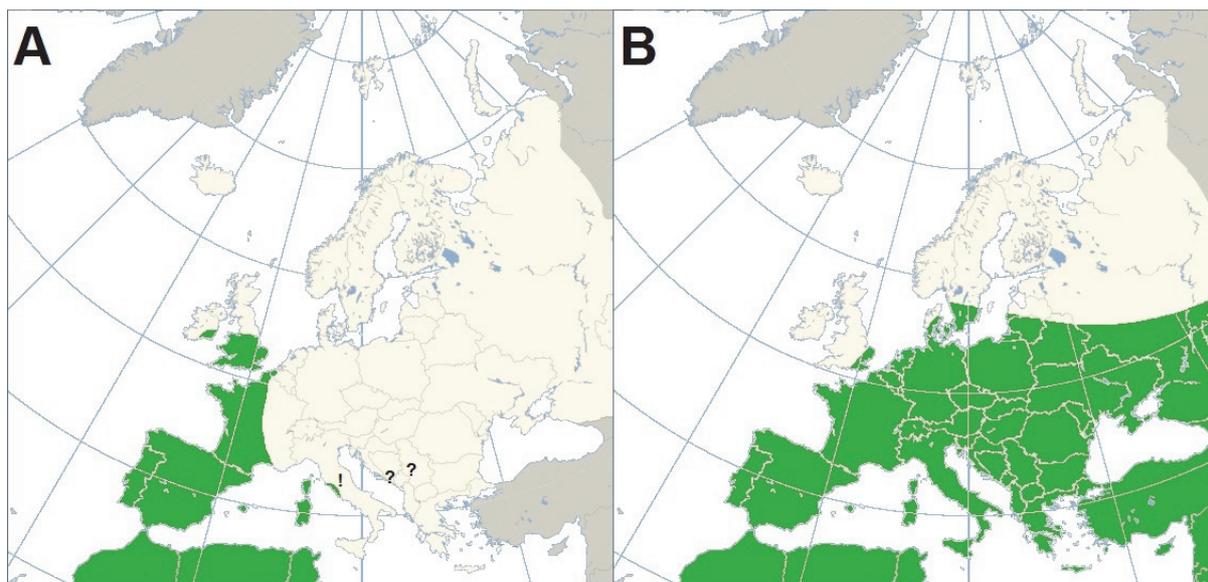


Fig. 3. European distribution of A. *Hydrovatus clypealis* Sharp, 1876 and B. *Hydrovatus cuspidatus* (Kunze, 1818). “!” indicates the population on the Italian mainland and “?” indicate the doubtful records in Croatia and Serbia by GUÉORGUIEV (1971).

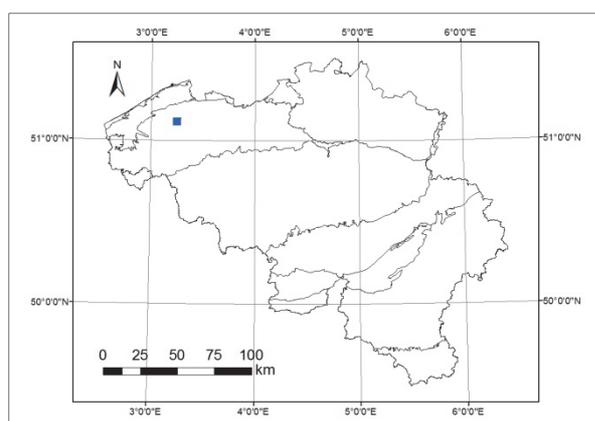


Fig. 4. Distribution of *Hydrovatus clypealis* Sharp, 1876 in Belgium from 2000-2017.

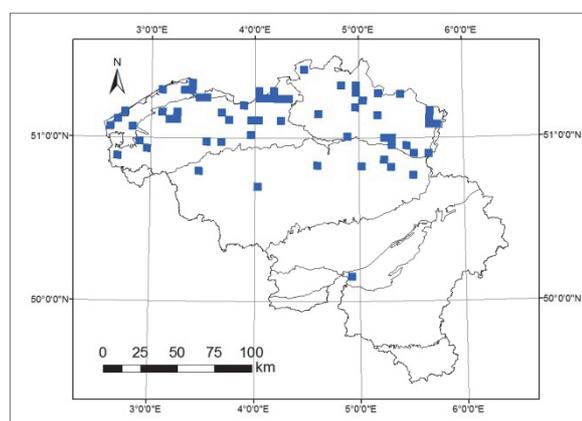


Fig. 5. Distribution of *Hydrovatus cuspidatus* (Kunze, 1818) in Belgium from 2000-2017.

### Update on the distribution of *Hydrovatus cuspidatus* (Kunze, 1818) in Belgium

As result of the recent expansion of *H. cuspidatus* the present European distribution is rather large, covering the whole of South- and Central Europe reaching southern Sweden in the North and South-east Britain in the West (NILSSON & HÁJEK, 2017b) (Fig. 3 B). The Flemish distribution of *H. cuspidatus* was mapped by SCHEERS (2014). Since then the records of this species have almost tripled and at present the *H. cuspidatus* is known from 61 squares. The main distribution in Belgium (Fig. 5) follows the low laying areas (Flemish region) and is unrelated to soil type or landscape. For now there is only one record from the Walloon region but this could be partly related to sampling effort.

### Discussion

The new record of *H. clypealis* is most likely the result of a new colonization rather than being overlooked in the past. The species is not known from The Netherlands, Germany or Luxembourg and the closest populations are in northwest France.

Although *H. clypealis* is now confirmed to occur in Belgium, the old record by d'Orchymont from the 19<sup>th</sup> century is still regarded as dubious and without a voucher specimen this record cannot be accepted.

Based on the distribution as known to date, the records of *H. clypealis* of Croatia and Serbia given by GUÉORGUIEV (1971) seem unlikely and the presence of this species in the Balkan needs verification.

Both species are most probably increasing as result of changes in the climate resulting in a more suitable climate in Northern-Europe for both species. *H. cuspidatus* has already expanded its range notably and it is not unlikely that *H. clypealis* is also expanding its range to the north. It is expected that *H. clypealis* will turn up at other sites in the coastal region of Belgium. The Belgian record is about 20km from the border with the Netherlands and probably the species will turn up there in the near future.

### Acknowledgments

The author wants to thank Michaël Manuel (UPMC, France) for pointing out the presence of *H. clypealis* near Dunkerque which indirectly lead to the discovery of this species in Belgium by increasing awareness. Franck Bameul (France) is acknowledged for providing me with detailed information on the distribution of *H. clypealis* in France. Furthermore thanks are due to Jan Soors (INBO, Belgium) for making the habitus pictures of live specimens collected in the field.

### References

- BISTRÖM O., 1996. - Taxonomic revision of the genus *Hydrovatus* Motschulsky (Coleoptera, Dytiscidae). *Entomologica Basiliensia* 19: 57–584.
- DOPAGNE C., 1995. - *Dytiscidae*. In: Coulon, G., (red.). *Enumeratio Coleopterorum Belgicae 1*. Koninklijke Belgische Vereniging voor Entomologie, Brussel. 298–302.
- FOSTER G.N., BILTON D.T. & NELSON B.H., 2016. - *Atlas of the Predaceous Water Beetles (Hydradephaga) of Britain and Ireland*. FSC Publications, Telford 370 pp.
- FOSTER G.N. & FRIDAY L.E., 2011. - Keys to the water beetles of Britain and Ireland (part1). Field Studies Council, Shrewsbury, 144 pp.
- FRANSISCOLO M.E., 1979. - *Coleoptera Haliplidae, Hygrobiidae, Gyrinidae, Dytiscidae*. Fauna d'Italia, Bologna, 804 pp.
- GUÉORGUIEV V.B., 1971. - Coleoptera Hydrocantares et Palpicornia. *Catalogus Faunae Jugoslaviae*, III(6): 1–45.
- IVERSEN L., PEDERSEN J. & THOMSEN P.F., 2011. - *Hydrovatus cuspidatus* Kunze 1818 – en naesten ny dansk vandkalv (Coleoptera, Dytiscidae). *Entomologisk Meddelelser* 79: 39–44.
- MILLÁN A., SÁNCHEZ-FERNÁNDEZ D., ABELLÁN P., PICAZO F., CARBONELL J.A., LOBO J.M. & RIBERA I., 2014. - *Atlas de los coleópteros acuáticos de España peninsular*. Ministerio de Agricultura, Alimentación y Medio Ambiente, Madrid. 820 pp.
- NIEUKERKEN E.J., 1979. - De verspreiding van *Hydrovatus cuspidatus* (Kunze) in Nederland (Coleoptera: Dytiscidae). *Entomologische Berichten*, 39: 51–55.
- NILSSON A.N. & HÁJEK J., 2017a. - *A World Catalogue of the Family Dytiscidae, or the Diving Beetles (Coleoptera, Adepaga)*. Internet version 31.I.2017. [http://www.waterbeetles.eu/documents/W\\_CAT\\_Dytiscidae\\_2017.pdf](http://www.waterbeetles.eu/documents/W_CAT_Dytiscidae_2017.pdf)
- NILSSON A.N. & HÁJEK J., 2017b. - *Catalogue of Palearctic Dytiscidae (Coleoptera)*. Internet version 2017-Jan-01. [http://www.waterbeetles.eu/documents/PAL\\_CAT\\_2017.pdf](http://www.waterbeetles.eu/documents/PAL_CAT_2017.pdf).
- PRZEWOZNY M. & BARLOZEK T., 2008. - Nowe stwierdzenia *Hydrovatus cuspidatus* (Kunze) i *Dytiscus circumflexus* Fabr. (Coleoptera: Dytiscidae) w Polsce. *Wiadomosci Entomologiczne* 27(1): 55–56.
- SCHEERS K., 2012. - *Rode lijst en verspreidingsonderzoek van de waterroofkevers (Coleoptera: Dytiscidae) van Vlaanderen*. Unpublished manuscript, Van Hall Larenstein, 39 pp.
- SCHEERS K., 2014. - On the increase of *Hydrovatus cuspidatus* (Kunze, 1818) and *Graptodytes bilineatus* (Sturm, 1835) (Coleoptera: Dytiscidae) in Belgium. *Bulletin S.R.B.E./K.B.V.E.*, 150(3): 195–198.
- VAN DORSSELAER R., 1957. - *Catalogue des Coléoptères de Belgique III, 4 Dytiscidae (Adepaga, Caraboidea)*. Société royale d'Entomologie de Belgique, Bruxelles, 3–31.