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Dryops griseus (Erichson, 1847) second record for Belgium and first record of *Augyles hispidulus* Kiesenwetter, 1843 and *Haliplus fulvicollis* Erichson, 1837 after 1949 (Coleoptera: Dryopidae, Heteroceridae, Haliplidae)

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Abstract

On 19.VI.2016, *Dryops griseus* (Dryopidae) was found in the nature reserve De Westhoek at De Panne in two semi-permanent dune ponds. This is the second record of this species for Belgium. On 22.VII.2016, *Augyles hispidulus* (Heteroceridae) was found in the nature reserve Tobruk in Knokke-Heist on the sandy shores of a pond. In samples from 2006 collected in Langdonken in Herselt (Kevin Scheers, INBO) one specimen of *Haliplus fulvicollis* was found.

Keywords: *Dryops griseus, Augyles hispidulus, Haliplus fulvicollis*, aquatic coleoptera

Samenvatting

Op 19.VI.2016 werd in natuurreservaat De Westhoek in De Panne in twee semi-permanente duinwateren de ruighaarwaterkever *Dryops griseus* gevonden. Dit is de tweede vondst voor België. Op 22.VII.2016 werd in natuurreservaat Tobruk in Knokke-Heist op de zandige oevers van een poel de oevergraafkever *Augyles hispidulus* gevonden. In stalen van 2006 uit de Langdonken in Herselt (Kevin Scheers, INBO) werd een exemplaar van *Haliplus fulvicollis* gevonden.

Résumé

Dryops griseus a été récolté le 19.VI.2016 dans deux mares semi-permanentes dans la réserve naturelle du Westhoek à De Panne. Cette donnée serait la seconde occurrence pour la Belgique. *Augyles hispidulus* a été trouvé dans la réserve naturelle de Tobrouk à Knokke-Heist le 22.VII.2016 sur les rives sablonneuses d'un lac. Un spécimen de *Haliplus fulvicollis* a été trouvé dans des échantillons provenant d'une étude en 2006 de la réserve Langdonken à Herselt (Kevin Scheers, INBO).

Introduction

Historically, the coastal region hosts a number of rare water beetles. In an attempt to register which species could still be present at the Belgian coast, of few field trips were undertaken to list the water beetles in some coastal areas. This article states the most interesting records and one inland record of a rare water beetle. Belgium counts about 330 species of aquatic beetles.

Dryopidae

Belgium hosts nine species of Dryopidae of which four species are probably extinct because they are not recorded any more after 1955.

Most species of Dryopidae are semi-aquatic or riparian in both larval and adult stage and are considered as water beetles. They occur at or very close to water margins. The adults have strong claws, which enables them to crawl on vegetation or attach to stones, submerged rootlets, and decaying wood. The life cycle is known of only very few species. The eggs are laid in fresh or partly decaying plant tissues, moist places outside water, and on submerged wood. The number of larval instars is unknown. The larvae and adults are phytophagous, feeding on decaying plant matter, wood particles, and/or hyphae. The larvae of all central European species seem to be terrestrial, occurring in moist soil, sand, decaying plant matter, and under decaying wood. However, the first-instar larvae of *Dryops rufipes* (Krynicki, 1832) and *D. luridus* (Erichson, 1847) were observed to mine underwater in partly decayed plant matter. The adults are usually found in late spring and summer. Many species probably undertake dispersal flight after emergence (BOUKAL *et al*., 2008).

***Dryops griseus* (Erichson, 1847)**

Dryops griseus (4,5-5,1 mm) was found in the nature reserve De Westhoek (Agentschap Natuur en Bos (ANB)) in De Panne on 19.VI.2016 (Fig. 1). The reserve consists mainly of dunes with a variety in ponds. In two ponds with emergent vegetation at the sides and shallow margins, specimen of *Dryops griseus* were found. Both ponds contained water at the moment of sampling but seemed to be semi-permanent. The beetles were found by skimming with a kitchen sieve between the plants on the water surface and a little below water surface. While entering the pond, water plants were temporarily pushed under the water surface creating tremple area's that were also searched for water beetles.

Fig. 1. *Dryops griseus*, nature reserve Westhoek in De Panne (19.VI.2016, photo Camille Locatelli).

One pond was rather large, about 30 m wide and 230 m long. Here three males of *Dryops griseus* were found. It also hosts the water beetles *Dryops luridus*, the crawling water beetle (Haliplidae) *Haliplus confinis* (which is confined to Characeae), *Noterus clavicornis* (Noteridae), the water scavenger beetles (Hydrophilidae) *Anacaena limbata, Cercyon sternalis, Chaetarthria spec., Cymbiodyta marginellus, Coelostoma orbiculare, Enochrus coarctatus, Enochrus testaceus, Helochares lividus, Helophorus aequalis, Helophorus obscurus, Hydrophilus piceus, Limnoxenus niger* and the diving beetles (Dytiscidae) *Hydrovatus cuspidatus* (vulnerable), *Hygrotus inaequalis*, *Graphoderus zonatus* (nearly threatened) and *Ilybius subaeneus* (threatened). For the diving beetles, the red list status for Flanders is given between brackets (SCHEERS, 2012). It is a diverse pond with a very small amount of open water and a lot of water plants in a slow gradient towards the surrounding dunes.

The other pond is rather small (a circle of diameter 15 meter) and hosts next to two males and one female of *Dryops griseus* also the following other water beetles: *Dryops luridus*, the crawling water beetle (Haliplidae) *Haliplus apicalis*, the water scavenger beetles (Hydrophilidae) *Anacaena limbata, Anacaena lutescens, Berosus signaticollis, Helophorus aequalis, Helophorus brevipalpis, Helophorus grandis, Helophorus griseus, Helophorus obscurus, Hydrobius fuscipes* and the diving beetles (Dytiscidae) *Hydroporus pubescens.*

Dryops griseus is on the Belgian species list (www.species.be) but there are no specimens in the collection of RBINS. FRENNET (1920) states the presence of *Dryops griseus* in Germany in the region of the Rhine and that the species needs to be searched for in Belgium. LODEWYCKX *et al.* (2004) published a species list with a record from Francis Verbeelen of one male and one female of *Dryops griseus* of 31.V.2004 in De Panne. Based on the UTM square mentioned (DS6859), I conclude that the species was also found at De Westhoek, but at another pond.

DROST *et al.* (1992) state this species inhabits more or less temporary waters in coastal dunes that are rain water-fed. The locality in Belgium fits in this description and this habitat seems to be very rare in our country.

Fig. 2. *Augyles hispidulus*, nature reserve Tobruk in Knokke-Heist (22.VII.2016, photo Camille Locatelli).

Fig. 3. Tobruk in Knokke-Heist (picture Hans De Blauwe).

Heteroceridae

Belgium hosts nine species of Heteroceridae with many halophilic species. From this family, four species are probably extinct because they are not found after 1948. Heteroceridae are riparian insects which live and reproduce in narrow winding burrows dug in damp mud at the water's edge. They are considered aquatic insects. They are able to dig with their mandibles and robust anterior legs provided with lateral spines which increase their burrowing capacity and are capable of burying themselves completely in the mud in 2-3 seconds.
When the water level rises or falls, these insects extend their burrows until they reach terrain with the correct humidity, that is with a water content between 30% and 60%. Flooding or draught can cause entire populations to take flight and migrate several kilometers away. Adults have well developed hind wings and are good flyers that are attracted by light.
Egg laying females and young larvae prefer a wet soil, while the pupae, larvae, males, and old or non-egg laying females prefer a drier soil.
With the approach of winter the specimens of the latest generation construct hibernating cells a few centimeters under the surface in sand or mud where they overwinter.
During all life stages, but particularly during the imago stage, heterocerids are profusely covered with water repellent hairs. These hairs retain a thin cushion of air in contact with the stigma ('breathing opening'), which allows the beetles to breathe in conditions where it would otherwise be impossible.
Adults feed mainly on plankton (MASCAGNI, 2015).

Augyles hispidulus Kiesenwetter, 1843

Augyles hispidulus (2,9-3,6 mm) was found on 22.VII.2016 in the nature reserve Tobruk (Agentschap Natuur en Bos(ANB)) in Knokke-Heist (Fig. 2). Here are three larger ponds in the dunes. One of them is ca 25 meter wide and ca 70 meter long and has a part of a few meters at the east-side of the pond where there is open sand under and above the water line.
This pond was, as the two other ponds, a sand pit in a former forest, which was planted in the years 1960 (Fig. 3). In 2010 most trees were felled and from most ponds the mud layer was removed and margins were leveled but at the place of the habitat of *Augyles hispidulus* the mud layer was not removed and margins were left (nearly) untouched. Probably since the years 1950, this spot is next to or even part of a larger heap of sand which is artificial but looks like a larger dune. Both factors make that the soil conditions are special in the sense that the (sandy) soil is much looser here while most (or all) other margins in this area are much more compacted.
This micro-habitat was investigated by throwing water on the shore and then collecting beetles which moved on the sandy margin and looking for beetles which floated on the water surface. Because members of the Heteroceridae family burrow under the ground surface, it is hard to find them without disturbing them by throwing water on the shore.
This technique resulted in one male and five females of *Augyles hispidulus*, together with one female *Heterocerus fenestratus*, one specimen of the burrowing ground beetle (Carabidae) *Dyschirius*

thoracicus and tens of specimen of the spinning water beetle (Hydrophilidae) *Laccobius minutus* and the ground beetle (Carabidae) *Omophron limbatum*. It all concerns beetles which were buried in the sand and only showed up after they were disturbed by the water, except for the water beetle *Laccobius minutus*, which typically lives in the loose sand just below the water line.
Both ground beetles are stated as rare on the Flemish red list (DESENDER *et al.,* 2008).
Concerning *Augyles hispidulus*, there were only 16 records from before 1950 from Belgium. In Flanders, the species was found in Antwerpen, Hemiksem, Hoboken, Rumst, Vilvoorde and in Wallonia in Angre with the most recent record from 1949 in Hoboken (leg. Dietz) (coll. RBINS). The first four localities are located near rivers Schelde and Rupel but the labels don't mention the exact finding location so only the villages are known. It is surprising that this is the first coastal record for this species while the species is known from the Dutch coast (www.waarneming.nl). Furthermore there are older (and a few recent) coastal records from other *Heteroceridae* like *Augyles aureoles*, *Augyles maritimus*, *Heterocerus fenestratus*, *Heterocerus flexuosus*, *Heterocerus fossor*, *Heterocerus marginatus* and *Heterocerus obsoletus* (Thys N., unpublished data).
MASCAGNI (2014) notes *Augyles hispidulus* occupies different habitats in Europe: river banks, sandy shores of streams and rivers, and mud at the edge of pools. The website www.coleo-net.de (principally dealing with the beetles in middle Europe) notes only that the species occurs on sandy soil and VAN STRIEN (1980) states the species is found at margins of fresh waters (such as water bodies in the dunes), streams and rivers and notes an experiment that showed the species prefers nearly saltless substrates.
The location in Tobruk is a fresh water dune pond with sandy margin, but the area of suitable habitat reaches only a few meters so it might be advisable to try to create more open sand (and higher dunes) near the present ponds.

Haliplidae

Belgium hosts 20 species of Haliplidae. Haliplidae mainly feed on algae and Characeae. Their legs are not so well adapted for swimming so they rather crawl/walk in the water by moving the hind legs.
Adults possess characteristically enlarged hind coxal plates, under which they store a bubble of air allowing them to breathe oxygen dissolved in water.

Haliplus fulvicollis Erichson, 1837

Haliplus fulvicollis (2,5-2,8 mm) was found in a sample provided by Kevin Scheers (INBO, Instituut Natuur- en Bosonderzoek) and was labelled Herselt, Langdonken (L08) from the year 2006.
The nature reserve (Natuurpunt vzw) Langdonken in Herselt has a wide variety in acid waters and is well known for water beetles. It is known to contain at least 61 species of water beetles (THYS, 2014).
BOSMANS (1994) mentions four old records of *Haliplus fulvicollis* before 1950: Vinderhoute (1923) in East-Flanders and Averbode (1916), Tervuren (1948) and Werchter (1939) in Flemish Brabant. Since then, no data are known for Belgium.
Bosmans describes the species as an acidophilic species, known from small mesotrophic, temporary, slightly acid waters with only few algae. On http://artfakta.artdatabanken.se/ the species habitat for Sweden is described as open sun exposed shallow and mostly temporary waters on clay and marshes with muddy soil and acid water.
BOUKAL *et al.* (2008) note this is a Euro-Siberian species, distributed in Belgium, the Netherlands, Germany, Poland, Czech republic, Slovakia, Austria, northern Italy, the Balkans, European Russia, and western Siberia. Nowadays, it is probably the rarest species of the family in the Czech Republic due to its habitat requirements. According to HOLMEN (1987), the habitat includes sun-exposed marshes and peat-bogs with temporary water. In the Czech Republic it prefers mainly shallow periodical water bodies. It is also very sensitive to habitat disturbances, especially to any changes to the shore zone, and indicates the continuity and natural conditions of the habitat (BOUKAL *et al*., 2008).
In Germany this species is strongly threatened (HENDRICH, 2005), in France it only occurs in the north of the country (QUENEY, 2011), in the Netherlands it occurs in two provinces (DROST *et al*., 1992) and in Great Britain and Luxembourg this species is not recorded (VAN VONDEL, 2015).

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