

Y. BARBIER, de l'Université Mons-Hainaut a trouvé une seconde espèce: *A. micracantha* LOEW, 1856. Elle se distingue immédiatement de la précédente par la taille et la forme du troisième article antennaire, petit et arrondi.

Cet individu (femelle) a été capturé le 2 juin 1994 à Sidi Mhejmed Ou Said (33° 26' 36" N, -8° 02' 47" W, alt. 2m), au sol dans les dunes littorales. Ceci semble confirmer la remarque d'EFFLATOUN (1934) qui signale qu'une des caractéristiques des espèces du genre est de chasser presque toujours à l'affût sur le sol.

2° *Antiphrisson trifarius* (LOEW, 1849)

Le genre *Antiphrisson* LOEW, 1849, comprend 17 espèces paléarctiques, dont seul *Antiphrisson trifarius* est connu du Sud de la France. Quant à la présence de *A. trifarius* en Afrique du Nord, seul SEGUY (1927) le signale d'Algérie; cette citation est répétée par Musso (1978).

L'espèce est également présente au Maroc, comme l'atteste la récolte suivante: Errachidia, Vallée du Ziz, oasis de Zouala (970m), 1 mâle, du 6 au 10 mars 1997. Cet exemplaire, recueilli par R. WAHIS (Gembloux) dans un piège Malaise, a été identifié par comparaison avec les genitalia figurés par THEODOR (1980) ainsi que ceux d'un exemplaire originaire de Provence.

Cette capture à une date aussi précoce n'est pas étonnante sous ces latitudes. EFFLATOUN (1934) signale que *A. trifarius* est plutôt commune au mois de mars aux alentours du Caire et THEODOR (1980) la dit présente en mars et avril en Israël. Dans le Sud de la France, son pic d'activité se situe en juin (Musso, loc.cit.).

Le piège Malaise était installé sur les rives caillouteuses (galets), entre l'oued et les cultures irriguées; ce site présente des points communs avec ceux que Musso (loc.cit.) signale en Provence.

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The rediscovery for Flanders of *Dytiscus dimidiatus* BERGSTRÄSSER, 1778 and *Dytiscus lapponicus* GYLLENHALL, 1808 (Coleoptera, Dytiscidae) at the Groot Schietveld (Brasschaat)

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Summary

During a two month survey in 1993 on the Groot Schietveld, Brasschaat, in the northern part of the Province of Antwerp, we focused on aquatic macro-invertebrates. Two rare species of the genus *Dytiscus* were collected, namely *D. dimidiatus* BERGSTRÄSSER, 1778 and *D. lapponicus* GYLLENHALL, 1808. Both species were last recorded in Flanders in 1959. The specific ecological needs of these two water beetles are discussed together with their biogeographical distribution. We will briefly speculate about the current status of both species in Belgium.

Key-words : *Dytiscus dimidiatus*, *Dytiscus lapponicus*, acid fens, relic

Introduction

Members of the genus *Dytiscus* can easily be recognized by their large size (up to 44 mm), the yellow margins of collar and abdomen and the structure of the hind legs. The hind tibia is much longer than wide and the tibial spurs are of equal length (DROST *et al.*, 1992). The main feature in distinguishing the different species are the meta-coxal appendices. In Flanders the genus was represented by seven species in the first half of the century. Large diving beetles of the genus *Dytiscus* are becoming extremely rare in Belgium (BOSMANS, 1994) Five of them were considered to have vanished (BOSMANS, 1994; COULON, 1995), namely *Dytiscus circumcinctus* AHRENS, 1811 and *D. latissimus* LINNAEUS, 1758, present in large, unpolluted waterbodies such as lakes and ponds, *D. semisulcatus* O.F. MÜLLER,

1776 that preferred acid heathland fens and peatbogs (BOSMANS, 1994) and *D. dimidiatus* and *D. lapponicus*, that will be discussed in the present paper. Two species are considered unthreatened, namely *D. marginalis* LINNAEUS, 1758 and *D. circumflexus* FABRICIUS, 1801 (BOSMANS, 1994).

In the present paper, we will discuss the observation and rediscovery of two rare *Dytiscus* species, *D. dimidiatus* and *D. lapponicus*. By summarizing recently published data on their biogeographical and ecological situation, including our own findings, we will reconsider their status in Flanders.

Methods

Aquatic Coleoptera were collected during an extensive survey from 11 July till 11 September 1993 on the Groot Schietveld, Brasschaat (1560ha; 51°21'N, 4°35'E). This is a heathland relic situated in the northern Campine in the Province of Antwerp. Numerous natural pools of aeolian origin and man-made ponds are present. Most of these waters have very clear acid water and a sandy bottom with, at most, only a thin peaty layer on top. The water level depends strongly on precipitation. Because of the low availability of easily soluble minerals in the soil and their hydrological isolation, the chemical character of the waters is closely related to that of precipitation (DENYS & VAN STRAATEN, 1992).

Coleoptera were captured using a hand net as proposed by DE PAUW & VANNEVEL (1991). Animals were determined with DROST *et al.* (1992).

Observations and discussion

Five specimens of the genus *Dytiscus* were captured during the survey. Three of them were determined as *D. marginalis*. The other two specimens belonged to two rare species, *D. lapponicus* GYLLENHALL, 1808 and *D. dimidiatus* BERGSTRÄSSER, 1778.

D. lapponicus is one of the smaller species of the genus *Dytiscus* (23-29 mm). It can be distinguished from the other Dytiscinae by the broad collar margins and the yellow belly with black stains. Around the eyes, a small yellow margin can be detected. *D. dimidiatus* (32-38 mm) is larger and lacks the yellow front margin on the collar. It also has a very narrow yellow back margin on its collar (DROST *et al.*, 1992).

Both species can be distinguished from each other and from *D. marginalis* by the use of their meta-coxal appendices (DROST *et al.*, 1992). *D. dimidiatus* has rounded appendices, while *D. lapponicus* has very pointed ones. The appendices of *D. marginalis* lie somewhat in between.

BOSMANS (1994) recently reviewed the status of all aquatic beetles in Flanders. Both *Dytiscus*-species are assigned to the Red List category 'extremely rare'. In Flanders, both species have not been recorded since 1959. *D. lapponicus* was only encountered in Kalmthout between 1956 and

1959. Table 1 lists all observations in Flanders of *D. dimidiatus* after 1950 (C. DOPAGNE, pers. comm.). *D. dimidiatus* has recently been observed in Harchies ('85-'86) and Jumet ('77), in the southern part of Belgium (Walloon region).

Table 1. Observations of *Dytiscus dimidiatus* BERGSTRÄSSER in the second half of this century (data provided by C. DOPAGNE).

18.V.1950	Keerbergen
18.VI.1950	Zoerle-Parwijs
01.VII.1952	Bornem
xx.VII.1958	Keerbergen
15.VIII.1959	Keerbergen

In the Netherlands, both species appear also on the red list of endangered aquatic beetles (DROST *et al.*, 1992). According to the IUCN (United Kingdom), *Dytiscus dimidiatus* is endangered (formerly rare), while *Dytiscus lapponicus* is only considered at lower risk (nationally scarce) (FOSTER, in press).

Dytiscus lapponicus is known to be typhobiontic, occurring mainly in fens, heathland pools and peat-bogs (DROST *et al.*, 1992) on a sandy bottom (J. CUPPEN, pers. comm.). The absolute absence of fish in those fens is required (NILSSON & HOLMES, 1995). The biogeographical distribution of *D. lapponicus* is restricted to the northern part of Europe (FOSTER, in press; J. CUPPEN, pers. comm.). BEIJERINCK reported in 1932 the occurrence of *D. lapponicus* in the Netherlands in some peatmoors with a vegetation of *Sphagnum recurvum*, *Juncus supinus* en *Heleocharis palustris*. He stated that the species might be a glacial relic species, that reached the most southern border of its distribution area on the Dutch-Belgian border. EVERTS (1922) comes to the same conclusion. The observations of *D. lapponicus* (subspecies *disjunctus* Camerano) from some lakes in the Italian Maritime Alps should be treated likewise (BEIJERINCK, 1932). BALFOUR-BROWN (1950) suggests that the species distribution covered almost whole Europe, but during the retreat of the ice, some specimen managed to survive in the southern regions, but only in mountaneous areas such as the Alps and the Carpathians. *D. lapponicus* appears to be a rather common species in fens in the Dutch province of Drenth (DUURSMA, 1996). According to DUURSMA (1996), this species might be much more abundant than is generally accepted. In the United Kingdom (Scotland and Wales), the species occurs in exposed lochans with a typical peat substratum. Most of the time the observation sites were lying higher than 200 meter above sea-level (FOSTER, in press). FOSTER *et al.* (1992) observed the species in 6 out of 370 ponds in Ireland. In northern Sweden, this species has been found in semi-permanent ponds with *Sphagnum* covering the entire pond bottom

(NILSSON, 1984). In Germany, the species is known from a lot of locations, including the entire northern part of Brandenburg and Prussia, Pommern, Hesse and the region around the Rhine (HORION, 1941).

No observations are known from southern Europe. Apart from the observations in the Alps, the Groot Schietveld appears to be the most southern location where *D. lapponicus* has been encountered after 1950. (In november 1933, one female was discovered at Warsage, very close to the Dutch-Belgian border. BALFOUR-BROWN (1950) considers this observation as a 'stray specimen from a nearby Dutch habitat'.)

On the Groot Schietveld, *D. lapponicus* has been found in a relative large permanent acid (pH = 4.14) fen. It is a nutrient-poor fen with a vegetation that primarily consists of *Drepanocladus* sp., *Sphagnum* sp. and *Juncus bulbosus*. *D. lapponicus* was observed in July together with some typical fen beetles like *Bidessus unistriatus* (SCHRANK), *Graphoderus zonatus* (HOPPE), *Hydroporus obscurus* STURM, *H. umbrosus* (GYLLENHAL) and *Laccophilus ponticus* SHARP, besides some more cosmopolite species (e.g. *Noterus crassicornis* (O.F. MÜLLER), *Hygrotus inaequalis* (FABRICIUS)).

Dytiscus dimidiatus prefers large, nutrient-poor open water, with a peaty bottom (DROST *et al.*, 1992). BRAASCH (1989) found that beetles were much more frequent in permanent and semi-permanent waters than in temporary waterbodies that dry out in summertime. No preference was found between the different types of waterbodies. Beetles seemed to occur from circum-neutral dikes to acid ponds with a *Sphagnum*-vegetation. In fall, more individuals were encountered in *Sphagnum*-covered waterbodies. In the Netherlands, the species has been recorded in canals, fens and even garden ponds (J. CUPPEN, pers. comm). In the United Kingdom, *D. dimidiatus* is known to occur in rich fen vegetation in lowland drains and ponds (FOSTER, in press). *D. dimidiatus* is a West Palaearctic species, ranging to North Africa and the Caucasus (FOSTER, in press).

D. dimidiatus was found in september in a small, acid (pH 3,83) fen together with some specimen of *D. marginalis*, *Enochrus quadripunctatus* (HERBST), *Laccophilus ponticus*, and *Hydroporus striola* (GYLLENHAL). The habitat consisted of *Sphagnum* sp. and *Juncus bulbosus*.

The presence of *Dytiscus dimidiatus* in Belgium is not that strange, seen its habitat needs and distribution. It is possible that *D. dimidiatus* is only an overlooked species. Its resemblance to *D. marginalis* may confuse many insect watchers, since a binocular loupe is almost necessary in distinguishing both species. FICHTNER (1983) points out that *D. dimidiatus* has its main periods of activity in early spring (III-V) and late summer and fall (VII-XII). More sampling in these periods might produce more specimen in this area. Since no intention has been made to collect only large water beetles, it is also possible that some individuals escaped, since those larger predaceous beetles are very fast swimmers. Intensive collecting may therefore provide more observations. Since the species occurs also in the southern part of Belgium, its distribution may be more widespread than is generally accepted.

D. lapponicus, on the contrary, reaches its very most southern border in northern Flanders. Since Kalmthout and Brasschaat are lying close to its other, the presence of *D. lapponicus* in this area can be considered as the same relic. Therefore, we believe that the species will still be present in Kalmthout. The absence of *D. lapponicus* after 1949 in the Walloon Region might be due to the ecological preferences of this species, i.e. acid fens with a sandy bottom. There are almost no clean fens anymore in the Walloon Region with a sandy bottom. It might be possible that this species can not stand organic bottoms. The present distribution of *D. lapponicus* will be limited to the northern border of Belgium.

The specific ecological needs of both species are the main factors in determining their rarity. The acidification and the excessive manuring together with the resulting loss of their specific habitat, pose a major threat on the survival chances of both species in Flanders. In his study, FRISBIE (1987) stated that when the pH lowered till 3.0, a strong Ph-stress appeared and *Dytiscus* larvae were affected. *D. dimidiatus* populations are also threatened by overdue lowering of the groundwater table (BRAASCH, 1989; BOSMANS, 1994; FOSTER, in press).

Dytiscid waterbeetles, constitute a major part of the macrobenthos of stagnant water (LARSON, 1985; NILSSON & SÖDERBERG, 1996). Since most of these species are carnivorous, they also represent the upper level of the food chain in lakes and ponds where fishes and amphibians are lacking (LARSON, 1990). Especially, when we are dealing with acid heathland fens, these Dytiscid beetles become the major predators (VANHEMELRIJK, 1985; LEUVEN *et al.*, 1986). The decline in numbers of species and individuals of the genus may cause therefore serious problems in maintaining the aquatic coleoptera communities in these habitats and can, at least be considered to be an indication of the obvious overall degradation of this specific water-type.

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Recension

Alexander S. KONSTANTINOV & Natalia J. VANDENBERG, 1996. - *Handbook of Palearctic Flea Beetles (Coleoptera: Chrysomelidae: Alticinae)*. Associated Publishers, Gainesville, USA.

Volume 1, Number 3 of the "Contributions on Entomology, International" is a 439 page volume consisting (after a general introduction) of two main parts.

The first part gives an overview of the Palearctic Flea Beetle Fauna, a key to the "Palearctic Alticine Genera" and an "Annotated List of the Genera". The key, which includes all 57 genera known from the Palearctic region (with the exception of two rare genera of which the authors could not obtain material) has a length of 19 pages and is very well illustrated. The characters used in the numbered couplets (describing the alternatives) of the key are made clearly visible by means of over 100 detailed drawings. It is the most complete key to the Palearctic Alticinae since the key of HEIKERTINGER (1941), to which it contains several nomenclatural changes. The annotated list of genera gives for each genus a short overview of the synonyms, information about the type species, the distribution, the number of described species, host plants and an extensive diagnosis. For each genus one species is illustrated by a high quality drawing which shows the complete animal.

The second part of the book is a key to the Palearctic and Oriental *Aphthona* species associated with *Euphorbia*. The key is constructed in the same way as the genera key of the first part, and is also very well illustrated. Each time an identification at the species level is accomplished, a brief diagnosis of the identified species is given. Finally the authors show detailed drawings of the antennae, hind tibia and tarsus, spermatheca, vaginal palpi, tignum and aedeagi of each of the considered species.

The book gives a good and complete overview of the flea beetle genera of the Palearctic region, and is no doubt very useful for any person interested in this huge subfamily of the Chrysomelid beetles. The high quality of the illustrations will make identifications easier for those who are not familiar with the subfamily. The first part of the book should allow everyone interested in Alticine beetles to identify Palearctic material up to the genus level. The second part of the book is more specialised and is mainly useful for biological control workers (as indicated in the preface of the volume). As the key mainly focusses on *Aphthona* species feeding on