

*Gyrinus natator* (LINNAEUS, 1758) (Coleoptera, Gyrinidae)  
a species of "whirligig" beetle new to the Belgian fauna  
with notes on its identification

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Summary

*Gyrinus natator* (LINNAEUS, 1758) is recognised for the first time in Belgium. The authors review its taxonomic status and provide an overview of its identification characteristics as contrasted against the closely related *Gyrinus substriatus* STEPHENS, 1828.

Samenvatting

*Gyrinus natator* (LINNAEUS, 1758) wordt voor de eerste keer uit België gemeld. De auteurs geven een overzicht van de taxonomische status van deze soort en evalueren de determinatiekenmerken t.o.v. de nauw verwante *Gyrinus substriatus* STEPHENS, 1828.

Introduction

The distribution and ecology of the Belgian Gyrinidae, often called "whirligig beetles", is only poorly known. The most recent catalogue covering the complete Belgian territory already dates from 1957 (MOUCHAMPS, 1957) partly based on the work of VAN DOORSELAER (1920). More recently a detailed survey on the distribution of Gyrinidae was performed by VAN STALLE & BOSMANS (1981) in the provinces of Western and Eastern Flanders. This survey showed that Gyrinidae have become rare during the second half of the twentieth century, mainly caused by the poor water quality in many parts of Belgium.

The catalogue of MOUCHAMPS (1957) mentions 9 representatives of the family to occur in Belgium, of which 7 belong to the genus *Gyrinus*, namely *G. aeratus* STEPHENS, *G. caspius* MÉNÉTRIÉS, *G. marinus* GYLLENHAL, *G. minutus* FABRICIUS, *G. paykulli* OCHS (= *G. bicolor* FABRICIUS according to FRIDAY (1988)), *G. substriatus* STEPHENS and *G. suffriani* SCRIBA. *G. distinctus* AUBÉ was not listed by MOUCHAMPS (1957) but clearly recognized by VAN STALLE & BOSMANS (1981). The remaining Belgian species are *Autonogyrinus concinnus* KLUG and *Orectochilus villosus* MÜLLER.

In this contribution, *Gyrinus natator* (LINNAEUS) is added to the Belgian list. *G. natator* has long been ignored as a separate species (cf. BALFOUR-BROWNE, 1950). Moreover, it was rather misleadingly diagnosed in commonly used identification works such as DROST

& SCHREIER (1978) and FREUDE & HOCH (1971, "Die Käfer Mitteleuropas") by using colouration characteristics. Therefore, it seemed worthwhile to try to clarify some aspects of its taxonomic position and identification.

#### *Gyrinus natator*, a separate species

Taxonomic discussions have been widespread within the Gyrinidae and many of these have been summarized in the leading work of BALFOUR-BROWNE (1950) on British water beetles. This author also considered *Gyrinus natator* (LINNAEUS, 1758) and *G. substriatus* STEPHENS, 1828 as synonymous. Although BRINCK (1940), based on a detailed study of male and female genitalia, already stated that both are valid species, BALFOUR-BROWNE (1950) did not follow this study basing his view on the variability of the elytral striae of *G. substriatus*. His view was followed by many, mainly British authors (see ANGUS & CARR, 1982) until POPE (1977) listed both *G. natator* and *G. substriatus* again as two valid British species in his check list.

Continental authors however, such as DROST & SCHREIER (1978) and OCHS (1967), did follow the view of BRINCK (1940) and consider both *G. natator* and *G. substriatus* as valid species. Unfortunately they neglected to some extent the importance of genitalic diagnosis by emphasizing the use of somatic characters such as colouration of mesosternum and anal sternite and the punctuation of the striae. FREUDE & HOCH (1971) in "Die Käfer Mitteleuropas" based their key on the work of OCHS (1967) and therefore provided a similar, misleading diagnosis of both species.

More recent research however, based on more and more specimens, reconfirms the initial work of BRINCK (1940). The thorough study of ANGUS & CARR (1982), using characteristics of both male and female genitalia rather than colouration and punctuation of the striae, leaves no doubt that both species can be distinguished with certainty. This also confirms the view of POPE (1977) and the identification guides of DROST & SCHREIER (1978), DROST *et al.* (1992) and FRIDAY (1988) follow this.

#### Identification

As stated above, identifying *G. natator* requires a careful examination of its genitalia. In the past, it has undoubtedly been confused with *G. substriatus*. Detailed studies on this subject have already been cited: ANGUS & CARR (1982) and BRINCK (1940).

The most stable and reliable diagnostic feature separating both clearly related species is the shape of the basal margin of the ovipositor lobes of the female (Fig. 2a). This margin bears a clear tooth in *G. natator* which is completely absent in *G. substriatus* (Fig. 2b) (see also DROST *et al.*, 1992; FRIDAY, 1988). This tooth in *G. natator* causes the basal margin to be sinuous as it was named by ANGUS & CARR (1982).

The length of the parameres provides the best separation for the males of both species, ranging from 1.00 - 1.11 mm in *G. natator* and 1.13-1.25 mm in *G. substriatus*. (measurements initially given by BRINCK (1940) and confirmed by ANGUS & CARR (1982)).

Besides this, several other characters have been mentioned in literature which can be helpful in identifying both closely related species. The shape of the male aedeagus can be of help (Fig. 1). It is more elongate in *G. substriatus* (Fig. 1b) than in *G. natator* (Fig. 1a) and the median constriction is nearer to the apex in the latter (compare also with illustrations in ANGUS & CARR (1982)).

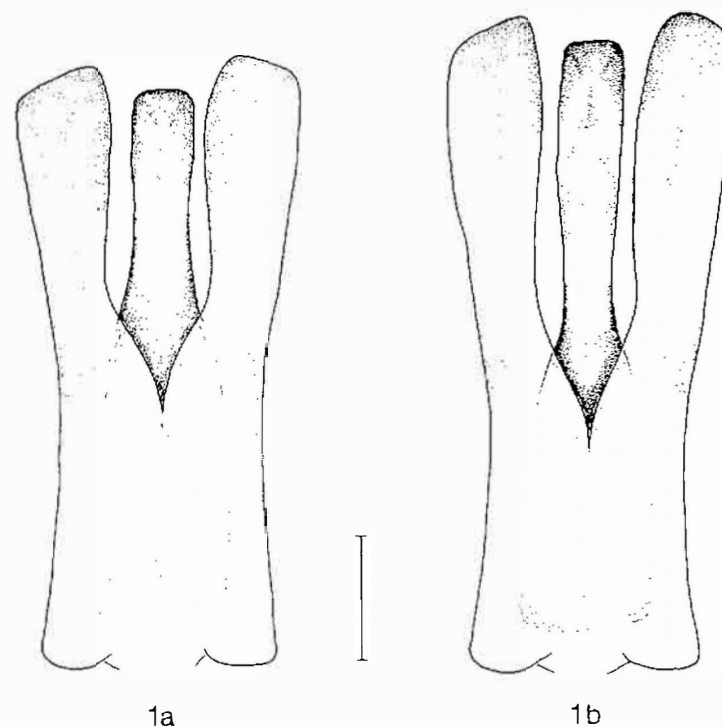


Fig. 1. Male aedeagus and parameres of (1a) *G. natator* and (1b) *G. substriatus* (based on Belgian material). Scale bar = 0.2 mm.

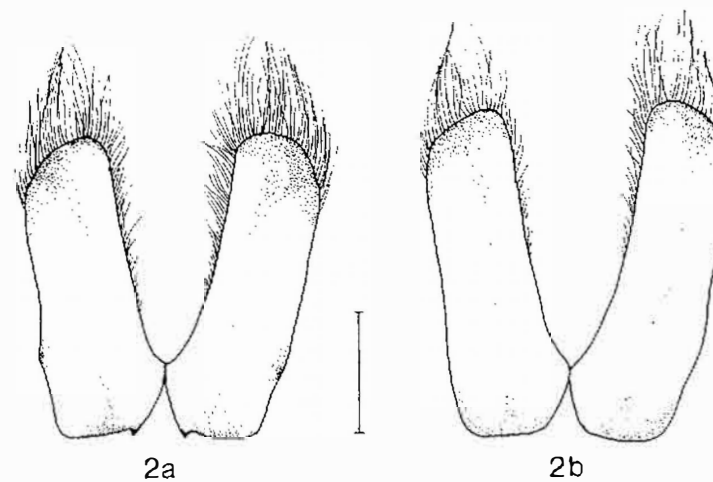


Fig. 2. Female ovipositor lobes of (2a) *G. natator* and (2b) *G. substriatus* (based on Belgian material). Scale bar = 0.2 mm.

The commonly used works of DROST & SCHREUER (1978) and FREUDE & HOCH (1971) uses the depth of the punctuation of the striae and the colouration of the mesosternum and anal sternite as the most important diagnostic characters. BALFOUR-BROWNE (1950) considered the punctuation of the striae to be highly variable and of no taxonomic value in this context. Although *G. substriatus* tends to be paler than *G. natator*, it should be noted that colouration of the pale parts of the underside as used by several authors in the past is not a reliable character for distinguishing between both (ANGUS & CARR, 1982; FRIDAY, 1988).

Because the mesosternum and anal sternite of the Belgian material of *G. natator* treated in this paper are paler, it keys out at *G. substriatus* when using FREUDE & HOCH (1971). However, genitalic features prove it to belong to *G. natator* (ANGUS & CARR, 1982; DROST *et al.*, 1992; FRIDAY, 1988). The common use of BALFOUR-BROWNE (1950) and especially DROST & SCHREUER (1978) and FREUDE & HOCH (1971) by Belgian entomologists (e.g. VAN STALLE & BOSMANS, 1981) might thus explain why *G. natator* has not been recognised in Belgium until now.

#### *G. natator* in Belgium and its habitat requirements

We collected one male and one female of *G. natator* in the province of Antwerp at Oostmalle in a small, permanent, oligotrophic water body called "Het Klokkeven" (29.VI. 1991, leg. ALDERWEIRELDT M. & DE WINTER A.).

The habitat requirements of this species are poorly known because relatively few captures have been fully documented. For Britain, FRIDAY (1988) mentions acid lakes as the typical habitat but this is of little help. The species now seems extinct in Britain although it is widespread in Ireland (R.B. ANGUS, pers. comm.). There it occurs in small pools and ditches with emergent vegetation (G.N. FOSTER, pers. comm. via R.B. ANGUS). In southern Sweden *G. natator* occurs in similar habitats as *G. substriatus* but in much lower numbers: marshes, water-filled quarries, gravel pits, quiet streams (SVENSSON, 1969).

The species has also been recorded from the other neighbouring countries. In France it was found in the Gironde area (BAMEUL, 1985). In The Netherlands, *G. natator* is to be considered as very rare. No capture localities are known since 1924 (DROST *et al.*, 1992) but this might have the same causes as stated above for Belgium. According to DROST *et al.*, the distribution centre of *G. natator* lies in central and eastern Europe.

#### Conclusion

Because of the extreme confusion in literature on the status and diagnosis of both *G. natator* and *G. substriatus* in the past, it might thus be worthwhile to re-examine the Belgian material identified as *G. substriatus* and check genitalia. Probably more true *G. natator* specimens will then be discovered in Belgium.

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