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## AQUATIC BEETLE FAUNA OF GEMENC LANDSCAPE PROTECTION AREA, SOUTH HUNGARY (COLEOPTERA: HYDRADEPHAGA, HYDROPHILOIDEA)

Z. CSABAI<sup>1</sup> – J.N. NOSEK<sup>2</sup>

<sup>1</sup>University of Pécs, Department of General and Applied Ecology, Ifjúság útja 6., H-7624 Pécs, Hungary, csabai@ttk.pte.hu

<sup>2</sup>HAS Hungarian Danube Research Station, Jávorka S. 14., H-2131 Göd, Hungary, nosek@botanika.hu

### A GEMENCI TÁJVÉDELMI KÖRZET VÍZIBOGÁR FAUNÁJA (COLEOPTERA: HYDRADEPHAGA, HYDROPHILOIDEA)

CSABAI ZOLTÁN<sup>1</sup> – NOSEK JÁNOS<sup>2</sup>

<sup>1</sup>Pécsi Tudományegyetem, Általános és Alkalmazott Ökológiai Tanszék, 7624 Pécs, Ifjúság útja 6.

<sup>2</sup>MTA ÖBKI Magyar Dunakutató Állomás, 2131 Göd, Jávorka S. u. 14.

**KIVONAT:** 2004 és 2005 folyamán 4 alkalommal végeztünk gyűjtéseket a Gemenci Tájvédelmi Körzet területén 39 mintavételi helyen, amely során 77 vízbogárfaj előfordulását tudtuk regisztrálni (7 Haliplidae, 33 Dytiscidae, 2 Noteridae, 3 Gyrinidae, 1 Spercheidae, 4 Hydrochidae, 8 Helophoridae, 19 Hydrophilidae).

A vizsgált vizek habitusa alapján igen változatos faunára számítottunk, azonban a fajlista e feltevésünket csak részben igazolta. Magyarország leggyakoribb faja, a minden víztértípusban szinte bármikor fellelhető *Rhantus suturalis* mindössze egy példányban került elő, de a többi gyakori faj egyedszámai is messze elmaradtak a más hasonló területeken tapasztalható viszonyoktól. Számos további gyakori fajt hiába kerestünk a területen. Ugyanakkor az országosan ritka előfordulású fajként említhető *Rhantus consputus* lett a terület leggyakoribb faja (19 előfordulással). E faj a területen szintén meglévő *Ilybius neglectus* fajjal együtt úgy tűnik a nagyobb hazai folyók természetközeli árterületeire jellemző karakterfajának tekinthető, eddigi recens adataik nagy része a Bodrog és a Tisza ártereiről származik. Mindezek arra engednek következtetni, hogy a Gemenci ártér a vízbogarak szempontjából igen sajátos feltételeket nyújtó vizekkel rendelkezik.

A vizsgált vizek közül legnagyobb fajszámmal jellemezhető, faunisztikai szempontból legértékesebb élőhelyeinek tekinthető vizeknek a Forgó-tó (Őcsény), a Decsi-Nagy-Holt-Duna és a Malomtelelő tó összekötő csatornája (Decs) és a Nagy-Gyékyényes (Baja) bizonyult. Faunisztikai szempontból érdemes kiemelni a *Helophorus croaticus* előkerülését, amit eddig Magyarországon szintén csak a Bodrog és a Tisza árteréről ismertünk.

**ABSTRACT:** In the years 2004 and 2005 faunistic samplings have made at 39 sampling sites in Gemenc Landscape Protection Area. The occurrence of 77 species (7 Haliplidae, 33 Dytiscidae, 2 Noteridae, 3 Gyrinidae, 1 Spercheidae, 4 Hydrochidae, 8 Helophoridae, 19 Hydrophilidae) was reported.

Based on the habits of the sampled water-bodies rich and diverse aquatic beetle fauna was expected. This expectation was only in part certified by species list. *Rhantus suturalis* which is the most common aquatic beetle in Hungary and can be found every kind of water bodies was represented only by one single specimen. Other common species found in the territory were captured in significantly lower number of individuals than in other similar territories of Hungary. Some other common species were not collected in Gemenc. A nationwide rare species, *Rhantus consputus* were the most common species in Gemenc-floodplain. Most of the recent occurrences of this species were known from the floodplains of Bodrog and Tisza rivers, just like of *Ilybius neglectus*. These points to the fact that water-bodies of Gemenc-floodplain may provide quite special environmental conditions for aquatic beetles.

From the faunistical point of view the most valuable territories characterized by high species richness were Forgó-tó, N (Ócsény), Canal connecting Decsi-Nagy-Holt-Duna and Malomtelelő-tó (Decs) and Nagy-Gyékényes (Baja). The occurrence of *Helophorus croaticus* is important faunistic result, this species formerly known only from the floodplains of Tisza and Bodrog rivers (NE Hungary).

**Key words:** aquatic coleoptera, faunistics, occurrence data, floodplain

## Introduction

The Gemenc Landscape Protection Area, the so called „Gemenc”, the last near natural floodplain of the Hungarian Danube is situated on the right side of the Danube between the outlet of Sió (river km mark 1498) and the outlet of the Batai arm (river km mark 1465).

The area has been formed both by the water regime of the Danube and the human regulating activity. The recent situation is the result of the dam building between 1870 and 1872. The dam followed the estate boundary of the Primateship of Kalocsa between Bogyzsló and Bata, 3-8 km far from the Danube.

Due to the river bed allocations of the Danube and the human regulating activity there are on the floodplain a lot of side arms, oxbow lakes and wet meadows of different shape and size interconnected with a network of narrow artificial channels, called “fok”. The water level and hence the area, the hydrological character (running or standing water), the duration of inundation and the connection among the different water bodies depend on the actual water regime of the Danube. Apart from the side arms with permanent flow (e.g. Rezéti-Duna) the water bodies are independent from each other unless the water level of the Danube exceeds 350 cm on the water level gauge at Baja. Connection of the water bodies begins through the canals (“fok”) depending on their bottom level between 400 and 450 cm. Above 450 cm streaming will be permanent and at water levels greater than 600 cm the majority of the floodplain is covered by water.

The aquatic beetle fauna of Gemenc floodplain was almost completely unknown. There were published occurrence data of 3 species [*Rhantus latitans*, *Ilybius guttiger*, and *Laccobius minutus* (ÁDÁM 1986, 1992, GENTILI and CHIESA 1975)]

and some other unpublished older data of 12 species (*Peltodytes caesus*, *Laccophilus poecilus*, *Rhantus frontalis*, *Hydaticus seminiger*, *Cybister lateralimarginalis*, *Coelostoma orbiculare*, *Enochrus quadripunctatus*, *Helochares obscurus*, *Hydrobius fuscipes*, *Limnoxenus niger*, *Berosus signaticollis*, *Berosus frontifoveatus*) were known based on specimens deposited in Natural History Museum (Budapest) from Baja, without closer localities. These occurrences are not surely originated from Gemenc.

The first data originated surely from Gemenc was published by CSABAI et al. (2003a) from "Makkos" water system, which consist three smaller shallow ponds ("Belső-Makkos", "Nagy-Makkos" and "Kis-Makkos") located in the north part of Gemenc near to the outlet of Sió-canal. In this work authors presented occurrences of 32 aquatic beetle species.

## Materials and methods

In 2004 and 2005 faunistical surveys were carried out in water bodies of Gemenc Landscape Protection Area. During the selection of sampling periods and sampling sites we tried to ensure a great variety regarding both the water regime of the Danube and the types of water bodies. Dates of sampling were 24-26 August and 28-30 September in 2004, 13-16 June and 19-21 July in 2005. In the middle of June 2004 the water level of the Danube decreased below 350 cm and remained between 150 and 250 cm till end of September. Most of the canals dried out and the water level of several oxbow lakes (e.g. Decsi-Kis-Holt-Duna, Decsi-Nagy-Holt-Duna, Káposztás-Duna, Nyéki-Holt-Duna) did not exceed 15-25 cm. In 2005 the water level of the Danube was higher than 450 cm till end of May and decreased below 400 cm only the week before the sampling. Sampling in July was carried out two days after the culmination of the flood with 741 cm.

During the two year altogether 55 samples were taken from 39 places. Different sampling methods were used: majority of aquatic beetles mentioned in this work were captured by sweeping with a long handled pond net just above the substrate, on water surface, and among the submerged or emergent vegetation. Beyond netting some beetles were captured by manual singling from surface of submerged stones, wood stocks, etc. and in some cases with a triangle dredge. Beetles collected were preserved in situ in 70% alcohol.

Below in table 1. a total of 39 sampling sites are given with their name, in brackets with their administrative units and with used abbreviations (Figure 1.).

## Results and discussion

Our samplings at 39 sites result in occurrence of 984 individuals of aquatic beetles belonging to 77 taxa (7 Haliplidae, 33 Dytiscidae, 2 Noteridae, 3 Gyrinidae, 1 Spercheidae, 4 Hydrochidae, 8 Helophoridae, 19 Hydrophilidae).

In cases of 5 sites (DND2, SIO1, SUG2, SUG3, VED1) aquatic beetles were not found. The 77 aquatic beetle species found are the 36.3% of the Hungarian fauna. The most common species were *Rhantus consputus* (19 sites), *Halipus ruficollis* (19 sites), *Helochares obscurus* (18 sites), *Peltodytes caesus* (15 sites), *Laccophilus minutus* (14 sites) and *Hydrochus elongatus* (14 sites). Three species (*Porhydrus lineatus*, *Dytiscus marginalis* and *Helochares lividus*) which were formerly known from the territory (CSABAI et al. 2003a) were not found by recent samplings.

**Table 1.** Sampling localities with administrative units and its abbreviations

<b>Sampling localities (administrative units)</b>	<b>abbreviations</b>
1. Bártai-Holt-Duna I. (Báta)	<b>BTH1</b>
2. Bártai-Holt-Duna II. (Báta)	<b>BTH2</b>
3. Cserta-Duna I. (Baja)	<b>CSD1</b>
4. Cserta-Duna II. (Baja)	<b>CSD2</b>
5. Decsi-Kis-Holt-Duna, NW (Decs)	<b>DKD1</b>
6. Decsi-Kis-Holt-Duna, SW (Decs)	<b>DKD2</b>
7. Pocsolya near Decsi-Kis-Holt-Duna W (Decs)	<b>DKD5</b>
8. Decsi-Nagy-Holt-Duna, NW (Decs)	<b>DND1</b>
9. Decsi-Nagy-Holt-Duna, E (Decs)	<b>DND2</b>
10. Canal connecting Decsi-Nagy-Holt-Duna and Malomtelelő-tó (Decs)	<b>DND5</b>
11. Flooded meadow I. at Decsi-Nagy-Holt-Duna W (Decs)	<b>DND6</b>
12. Flooded meadow II. at Decsi-Nagy-Holt-Duna W (Decs)	<b>DND7</b>
13. Forgó-tó, N (Őcsény)	<b>FOT1</b>
14. Pocsolya near Forgó-tó W (Őcsény)	<b>FOT5</b>
15. Grébec-Duna, W (Decs)	<b>GRD1</b>
16. Hármás-zátony (Decs)	<b>HRZ1</b>
17. Pocsolya near Hármás-zátony W (Decs)	<b>HRZ5</b>
18. Holt-Sió I., protected area (Bogyiszló)	<b>HSI1</b>
19. Holt-Sió II., floodplain (Bogyiszló)	<b>HSI2</b>
20. Kerülő-Duna above Pörböly (Pörböly)	<b>KED1</b>
21. Káposztás-Duna, W (Baja)	<b>KPD1</b>
22. Malom-telelő-tó, SW (Decs)	<b>MAT1</b>
23. Canal connecting Malom-telelő-tó and Lassi-tó (Decs)	<b>MAT2</b>
24. Nagy-Gyékényes (Baja)	<b>NGY1</b>
25. Nyéki-Holt-Duna I., W (Báta)	<b>NYD1</b>
26. Nyéki-Holt-Duna II., W (Báta)	<b>NYD2</b>
27. Pap-fok (Decs)	<b>PAF1</b>
28. Sárkány-fok (Báta)	<b>SAF1</b>
29. Sió, flood-gate (Bogyiszló)	<b>SIO1</b>
30. Sulymos-fok I., E (Baja)	<b>SUF1</b>
31. Sulymos-fok II., E (Baja)	<b>SUF2</b>
32. Sulymos-fok, ditch (Baja)	<b>SUF3</b>
33. Sulymos-fok, flooded forest (Baja)	<b>SUF4</b>
34. Sugovica (Szeremlei-Duna) W, Petőfi sziget (Baja)	<b>SUG1</b>
35. Sugovica (Szeremlei-Duna) S, after Baja (Szeremle)	<b>SUG2</b>
36. Sugovica (Szeremlei-Duna) barrage at the outlet (Szeremle)	<b>SUG3</b>
37. Small pond near "Volt nyári legelő" narrow-gauge railway halt (Baja)	<b>TKD1</b>
38. Vajas-fok (Érsekcsanád)	<b>VAJ7</b>
39. Vén-Duna, S (Baja)	<b>VED1</b>

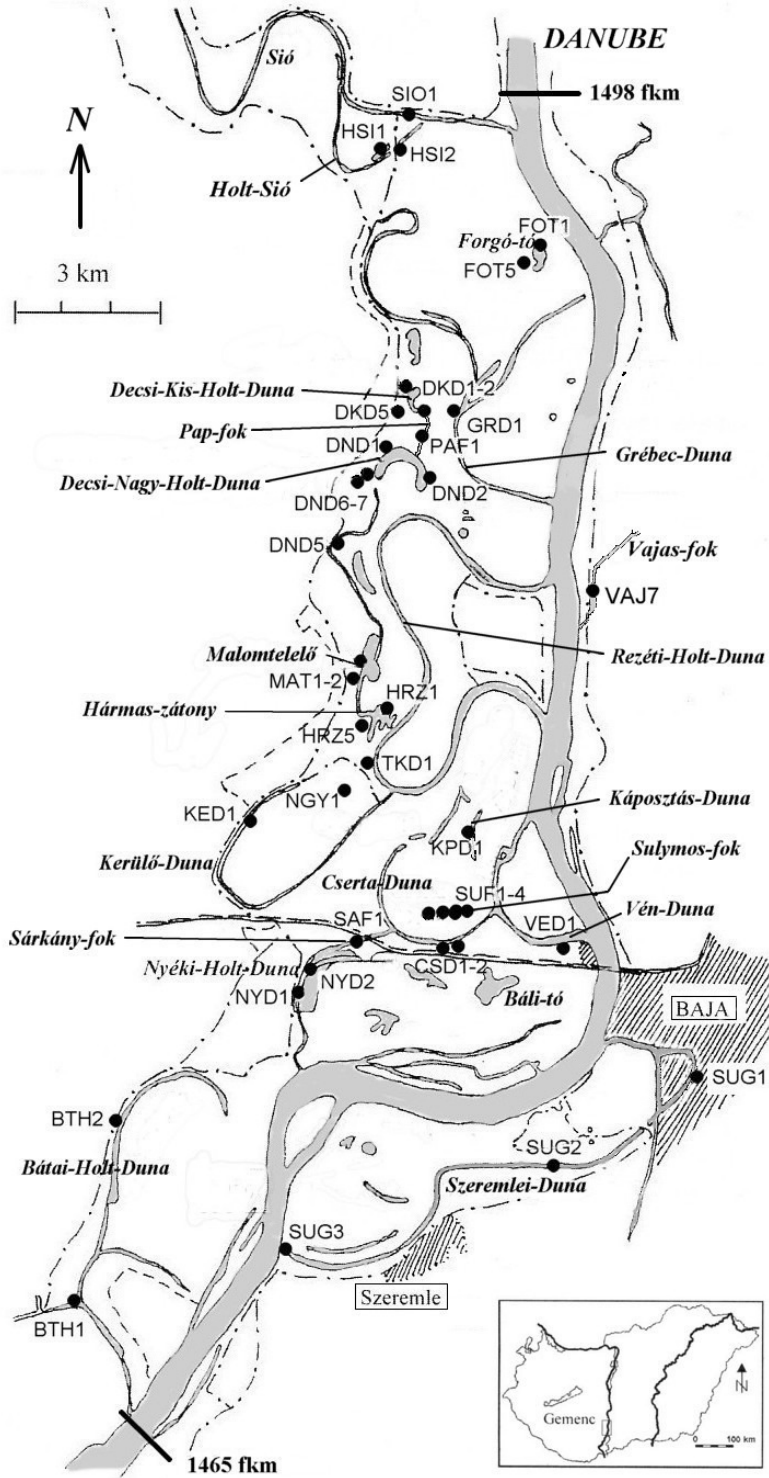
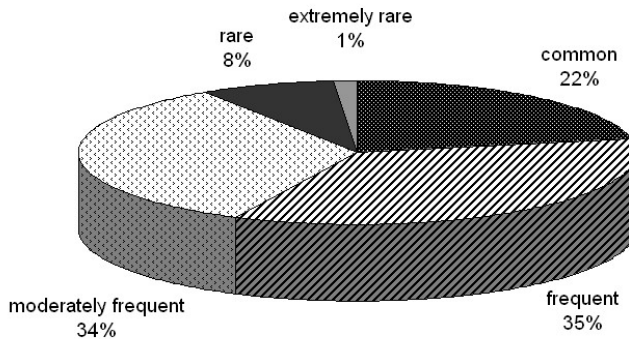
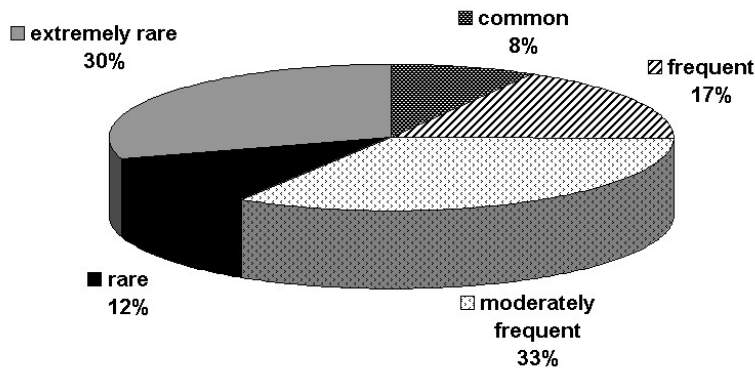


Figure 1. Sampling sites in Gemenc Landscape protection area.



**Figure 2.** Breakdown of the aquatic beetle species known from “Gemenc” by the nationwide frequency categories based on CSABAI (2003).



**Figure 3.** Breakdown of the aquatic beetle species known from Hungary by the nationwide frequency categories based on CSABAI (2003).

From the faunistical point of view the most valuable territories characterized by high species richness were FOT1 (30 species), DND5 (27 species) and NGY1 (24 species). The occurrence of species found in each sampling sites were summarized in Table 2.

On the basis of figure 2. and 3. clearly visible that the proportion of the „extremely rare” species in the fauna of the Gemenc-floodplain is lower than the proportion in the whole Hungarian aquatic beetle fauna. Worthy of note that the high proportion of this category in the Hungarian fauna mainly due to many species known from only special habitats or known only from few localities from Hungary. In this category there is only one species found in Gemenc, *Helophorus croaticus* which earlier was known only from some oxbow lakes and floodplains of Tisza and Bodrog rivers (NE Hungary) (GIDÓ et al. 2003).







Species	Sampling sites																											Σ								
	BTH1	BTH2	CSD1	CSD2	DKD1	DKD2	DKD5	DND1	DND5	DND6	DND7	FOT1	FOT5	GRD1	HRZ1	HRZ5	HSI1	HSI2	KED1	KPD1	MAT1	MAT2	NGY1	NYD1	NYD2	PAF1	SAF1		SUF1	SUF2	SUF3	SUF4	SUG1	TKD1	VAJ7	
<i>Laccobius minutus</i> (Linnaeus, 1758)				■			■					■	■	■	■			■							■											7
<i>Laccobius striatulus</i> (Fabricius, 1801)																■					■															1
<i>Cymbiodyta marginella</i> (Fabricius, 1792)																	■				■															2
<i>Enochrus affinis</i> (Thunberg, 1794)			■																						■			■								3
<i>Enochrus bicolor</i> (Fabricius, 1792)											■																									1
<i>Enochrus coarctatus</i> (Gredler, 1863)																					■															2
<i>Enochrus melanocephalus</i> (Olivier, 1792)																																				1
<i>Enochrus quadripunctatus</i> (Herbst, 1797)			■				■				■										■															10
<i>Enochrus testaceus</i> (Fabricius, 1801)																																				1
<i>Helochares obscurus</i> (O.F.Müller, 1776)	■		■		■		■		■			■			■				■		■				■			■		■		■				18
<i>Hydrobius fuscipes</i> (Linnaeus, 1758)							■		■			■							■		■				■			■		■		■				10
<i>Limnoxenus niger</i> Zschach, 1788																																				5
<i>Hydrochara caraboides</i> (Linnaeus, 1758)					■			●	●		■				●					■																11
<i>Hydrophilus aterrimus</i> Eschscholtz, 1822																																				1
<i>Hydrophilus piceus</i> (Linnaeus, 1758)					●				●																											4
<i>Berosus frontifoveatus</i> Kuwert, 1888					■																				●											2
<i>Berosus signaticollis</i> (Charpentier, 1825)											■	■	■																					■		4
Σ	3	2	18	10	16	4	13	19	27	1	8	30	10	3	6	19	9	6	12	14	9	8	8	24	13	14	1	14	7	7	10	8	2	9	4	

**Table 2.** Occurrence of 77 aquatic beetle taxa found in the 34 sampling sites (■ = imago data, ● = larval data, ■ = both).

In the “rare” category there are 6 species from Gemenc: *Hyphydrus anatolicus*, *Ilybius neglectus*, *I. subtilis*, *Rhantus consputus*, *Hydrochus brevis* and *Helophorus liguricus*. Interesting fact that *Rhantus consputus* which has only 46 known occurrence data (26 older than 50 years, most of them unpublished and 20 recent) from Hungary became the most common species in Gemenc (table 2). Most of the recent occurrences (18) were known from the Bodrog and Tisza floodplains just like of *Ilybius neglectus* (ÁDÁM and HEGYESSY 2004, CSABAI et al. 2003b). These seem to be characteristic species of floodplains of large rivers in Hungary.

Another interesting fact is that *Rhantus suturalis* which is the most common aquatic beetle in Hungary and can be found every kind of water bodies was represented only by one single specimen. In the cases of other common species found in the territory (*Noterus* spp., *Colymbetes fuscus*, *Enochrus bicolor*, *Cymbiodyta marginella*) can be said that these were captured in significantly lower number of individuals than in other similar territories of Hungary. These points to the fact that water-bodies of Gemenc floodplain may provide quite special environmental conditions for aquatic beetles.

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