

Zeitschrift: Entomologica Basiliensia
Herausgeber: Naturhistorisches Museum Basel, Entomologische Sammlungen
Band: 11 (1986)

Artikel: Comparison of diving beetles (Coleoptera, Dytiscidae) collected from above and from below a beaver (Castor) dam
Autor: Swenson, G.
DOI: <https://doi.org/10.5169/seals-980553>

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| Entomologica Basiliensia | 11 | 309–312 | 1986 | ISSN 0253-2484 |
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Comparison of Diving Beetles (Coleoptera, Dytiscidae) Collected from Above and from Below a Beaver (Castor) Dam

by **G. Swenson**

Abstract: Collections of dytiscid water beetles were made in a flooded *Carex lacustris* stand situated behind an active beaver (*Castor*) dam. These were compared to beetles collected in a drier area situated below the same beaver dam and dominated by *Carex rostrata*. Much of the collection in the site above the dam was made in the shade of alder (*Alnus rugosa*). The ecologically different sites, despite geographical proximity, yielded different collections.

Key words: Coleoptera Dytiscidae – *Hydroporus paugus* – beaver – *Carex* – Habitat comparison.

This study continues the work on regional water beetle populations in the Finger Lakes region. Previous studies focused on wide-ranging collections in this area. The next step appeared to be studying the collecting sites more closely and comparing different environments. Two sites were found in Michigan Hollow, where I had collected previously. They seemed to be appropriate sites for comparative study because, even though they were near each other, they had different ecological features.

The two sites are located near the west side of Michigan Hollow Road about 5 km south of Ithaca, New York. One of the collection sites was a deep water site dominated by *Alnus rugosa* and *Carex lacustris*. The water table was always 3–15 cm above the surface because the site was behind a beaver dam. Much of the collection in this site was made in the shade of alder (*Alnus rugosa*).

Collections were also made in a dry site dominated by *Carex rostrata* and *Leersia oryzoides*, where the water table was always below the surface except for small scattered pools varying in depth from 10–40 cm and for a discontinuous network of small rivulets draining the alder thicket. These little streams were about 15–40 cm wide and 20–30 cm deep. It was from these pools and streams that the collections were made. No distinct difference in the species of beetles collected from the two different sources was notable.

The collections were made primarily with a D-frame aquatic net, sporadically over ten years and weekly during the summer of 1983 in the *C. lacustris* site and only in the summer and early fall of 1983 and the spring and summer of 1984 for the *C. rostrata* site.

The species collected are listed in Table 1 according to those found in one or the other of the two sites and to those found in both sites.

Reference to Blackwelder's Red List and to Larson has indicated that most of the species are widely distributed in Northeastern America, BLACKWELDER (1973), LARSON (1975), (1983 personal communication).

| A. <i>C. rostrata</i> site | B. <i>C. lacustris</i> site | C. both sites |
|---|---|---|
| <i>Hydroporus melsheimeri</i> Fall | <i>Laccophilus maculosus</i> Say | <i>Hygrotus sayi</i> J. Balfour-Browne |
| <i>Hydroporus notabilis</i> LeConte | <i>Hygrotus nubilus</i> LeConte | <i>Hygrotus laccophilinus</i> (LeConte) |
| <i>Hydroporus signatus</i> Mannerheim * | <i>Agabus anthracinus</i> Mannerheim * | <i>Hygrotus impresso-punctatus</i> Schaller |
| <i>Agabus subfuscatus</i> Sharp | <i>Ilybius angustior</i> (Gyllenhal) | <i>Hydroporus undulatus</i> Say |
| <i>Agabus semivittatus</i> LeConte | <i>Ilybius pleuriticus</i> LeConte | <i>Hydroporus paugus</i> Fall * |
| <i>Agabus seriatus</i> (Say) | <i>Coptotomus interrogatus</i> Fabricius | <i>Hydroporus dentellus</i> Fall |
| <i>Agabus ambiguus</i> (Say) * | <i>Dytiscus verticalis</i> Say | <i>Hydroporus niger</i> Say * |
| <i>Agabus erythropterus</i> (Say) | <i>Hydaticus modestus</i> Sharp | <i>Hydroporus striola</i> Gyllenhal * |
| <i>Agabus erichsoni</i> (Gemminger & Harold) | <i>Acilius sylvanus</i> Hilsenhoff | <i>Agabus semipunctatus</i> Kirby |
| <i>Agabus leptapsis</i> (LeConte) | | <i>Agabus phaeopterus</i> (Kirby) |
| <i>Copelatus glyphicus</i> Say | | <i>Agabus gagates</i> Aubé * |
| <i>Dytiscus fasciventris</i> Say | | <i>Ilybius biguttulus</i> Germar * |
| | | <i>Colymbetes sculptilis</i> Harris |
| | | <i>Rhantus binotatus</i> Harris |
| | | <i>Acilius medius</i> (Say) |
| | | <i>Graphoderus fascicollis</i> Harris |

Tab. 1: Species collected listed according to site of collection. Asterisk after a species name indicates that species was collected in large numbers.

However, in the Finger Lakes, of the 37 species listed in table 1, I have previously reported collecting 28 species, SWENSON (1979, 1982). Of the remaining 9 species only 3 have not been collected by me at any other site. They are a few specimens of *Agabus leptapsis* and one female *Agabus erythropterus* from the *C. rostrata* site and *Ilybius pleuriticus* from the *C. lacustris* site. Further, *Hydroporus paugus*, which previously I have collected one or two at a time and not often from various sites, has appeared in great numbers in the *C. rostrata* site. Many collected from that site were teneral. These teneral ranged in appearance in the collections from June 2nd to August 5th but most of them were collected in July. The *H. paugus* generally were collected from both the pools and the rivulets in the *C. rostrata* site.

Conclusions

First of all, this study suggests that site comparisons should be both intensive in collection and extensive in years of continuing study. Unless one can collect and identify larvae and teneral adults it is difficult to be sure whether a given species is a transient or a breeding resident. Also, different additional sets of compared sites should be studied to see if consistent patterns of species occupancy can be determined.

It was of interest to note that the number of individuals in each of the various species collected was low in the *C. lacustris* site, especially as compared to the *C. rostrata* site when a given species appeared in both sites. Could it be that the open area is a more natural flyway for migrants than the shaded *C. lacustris* site is? Again, identification of larvae and teneral, when found, would reduce uncertainty as to which species are (regular?) transients and which are breeding residents.

Several puzzles emerged. *Acilius semisulcatus*, which I have found almost everywhere else I have collected was missing in the collections in these two sites. *Agabus leptapsis* appeared in small numbers in the *C. rostrata* site in 1983 and appeared not at all in 1984. *Agabus semivittatus* and *Agabus seriatus*, which I usually find in lotic conditions, appeared in the *C. rostrata* site, one or two of the few collected appearing in brown-water pools.

The appearance in great number of *Hydroporus signatus* and *Agabus ambiguus* exclusively in the *C. rostrata* site and of *Agabus anthracinus* exclusively in the *C. lacustris* site suggests a favored resi-

dency. However, no teneral were noted for these three species, suggesting further study is necessary.

In spite of low collection numbers for many of the species identified in this study and of other problems discussed above, there does appear to be a shadow of difference in the species profiles for these two adjacent but ecologically different sites. The level of significant difference is yet to be discovered for these two different environments.

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Author's address:
Prof. Dr George Swenson
Ithaca College
Department of Biology
Ithaca, New York, 14850 USA