

REPRINTED FROM  
Vol. 24 • No. 4 • 1973

# VIRGINIA JOURNAL OF SCIENCE

OFFICIAL PUBLICATION OF THE  
VIRGINIA ACADEMY OF SCIENCE

© Copyright, 1973, by the Virginia Academy of Science.

THE LIBRARY  
OF  
DON SCHWAB  
911



## The Aquatic Coleoptera of the Dismal Swamp

**Abstract**—A brief review of the aquatic habitats and an annotated list of the aquatic Coleoptera of the Dismal Swamp is presented. Six families with a total of 53 species are represented in the swamp but most species do not appear to be well adapted to the special conditions in the swamp and only seven species, *Hydroporus carolinus*, *H. lobatus*, *H. venustus*, *H. clypealis*, *Copelatus glypticus*, *Coptotomus i. interrogatus*, and *Dineutus carolinus* can be consistently found in the "typical" aquatic habitats within the swamp.

The Virginia portion of the Dismal Swamp is a low-land area on the eastern coast which is considered by recent authors to be delimited on the west by the 25 foot elevation line at the foot of the Nansemond Escarpment and on the east by the Dismal Swamp Canal and U.S. Route 17. The northern boundary is essentially the roadbed of the Norfolk and Western Railway, however, there are limited areas, particularly on the northwestern boundary, which extend beyond the roadbed. The southern boundary is the North Carolina-Virginia state line.

The Dismal Swamp exhibits an interesting diversity of aquatic situations which are suitable as habitats for water beetles. The predominant vegetation of the swamp is a mixed hardwood forest which is subject to frequent and often extensive flooding. The woodland pools left behind when the flooding recedes support a variety of water beetles. The canals which gird the swamp also support a number of beetles, with the species distribution depending, to a great extent, on the source of the water and the flow rates in the canals. Lake Drummond provides a rather restricted habitat which supports one distinctive species found nowhere else in the swamp. Several minor areas such as willow swamps, marshes and sand bottomed pools add to the variety of aquatic habitats.

Modern studies on the Dismal Swamp have been limited. Murray (1), discussed the birds of the area, Dean (2) has dealt with the forests and forestry in the swamp and the soil were studied by Henry (3). The waters of the swamp were briefly discussed by Ramsey et al. (4) and its fish as well as some philosophical comments were presented by Andrews (5).

While disparaging remarks concerning the mosquito and deer fly populations of the swamp appear in several papers, the only study on the insect fauna was done by Gurney (6) in his natural history treatment of the area. This work discusses the distribu-

tion and abundance of several insect groups with an emphasis on the Orthoptera.

The material included in the present paper is primarily the result of 75 collections made over a two year period. During the course of the investigation over 1000 aquatic beetles were collected, mounted and identified. Material not in the author's collection has been included wherever possible, however, this is quite limited. Six families of aquatic Coleoptera with a total of 53 species have been recorded from the Dismal Swamp.

### A Summary of the Aquatic Habitats of the Dismal Swamp

A review of the aquatic habitats of the Dismal Swamp is given below. Reference to the collection sites given in the discussion of each species, listed below and on figure 1 will allow the reader to determine the distribution and habitat preference of each beetle.

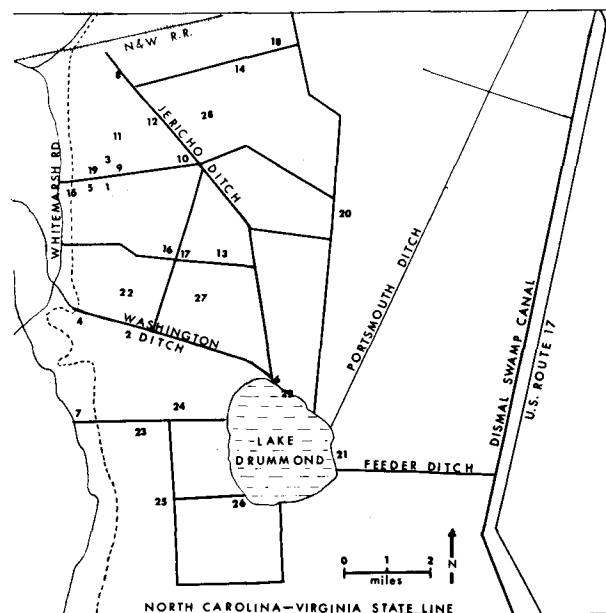


FIG. 1—Map of the Dismal Swamp showing the major ditches and the location of collecting sites. The dashed line represents the 25 foot elevation line at the foot of the Nansemond Escarpment.

## WOODLAND POOLS

The woodland pools include a broad range of aquatic habitats. Those pools located near the edge of the swamp, (sites 1, 3, 7, and 11) are usually relatively shallow, not extremely acid (pH 6-7) and often have a very diverse beetle fauna. Many of the pools located in the interior are deeper, most are more acidic and most have a more restricted beetle fauna (sites 14, 17, and 20). Sites 22, 27, and 28 are shallow woodland pools located in the interior of the swamp, fluctuating greatly in size with the season of the year, but rarely getting over 2-3 feet deep, and often becoming quite shallow or completely drying. The vast majority of aquatic situations in the swamp are pools of this type.

Site 9 is a relatively shallow pool located in a clearing near the periphery of the swamp. The bottom is carpeted with aquatic vegetation and the water is quite clear in contrast to the brownish color of most pools in the swamp. Site 19 is also a clear-water pool, however, it is quite deep and surrounded by trees. It has a sand bottom rather than one of clay or peat and no significant amounts of aquatic vegetation.

Site 21 appears to be a unique area of the swamp; the pools appear quite stagnant the water is very acidic (pH 3.5), there is no observable aquatic vegetation present and no aquatic beetles were found in this area.

## THE DITCHES

The character of the ditches varies with the source of the water flowing into them. Those that drain large areas of the swamp (and this includes most ditches) are quite acid in nature, (pH 4-5) support little rooted vegetation, and normally support a limited aquatic beetle fauna (sites 12, 13, 16, 23, 24, and 25). The ditches which have their primary drainage area outside of the swamp, principally Washington Ditch (sites 2, 4, and 6) and a cross ditch on Jericho Lane (site 19) are quite different from the other ditches. While Washington Ditch drains large areas of the swamp, a good deal of its water comes from surrounding farmlands and is much less acid (pH 6-7 in some areas) in nature than the waters of other ditches in the swamp. Rooted vegetation is quite abundant and the aquatic beetle fauna is more diverse than in the other ditches.

## LAKE DRUMMOND

The absence of any rooted aquatic vegetation along the margin, the acidity (pH 4.0-4.5) and often heavy wave action place severe limitations on the aquatic beetle fauna of Lake Drummond. Despite many attempts the author has never collected any aquatic beetles in Lake Drummond. However, a single species, *Hydrophilus triangularis*, is recorded from the Lake. Sites 26 and 29 represent the primary collection areas although collections have been attempted along much of the periphery of the Lake.

## MINOR AQUATIC SITUATIONS

Several small and rather atypical aquatic areas

occur in the swamp and for lack of a better arrangement they will be discussed here. Site 5 is a narrow willow (*Salix niger*) swamp beside Jericho Lane. It is steep banked, brushlined, and usually covered with a thick growth of duckweed. Beetles were usually collected at the margin clinging to the banks or on submerged aquatic vegetation.

Site 15 is a small bog characterized by large clumps of *Typha latifolia* and *Juncus effusus* which is located at the very edge of the Dismal Swamp on Jericho Lane. It is the only area of this type which has been encountered within the area studied.

Sites 8 and 10 are semipermanent puddles in or beside roads in the swamp. The long string of large puddles which made up site 8 has recently been filled and leveled during the process of road improvement. This was a particularly rich collecting area; on one occasion, June 25, 1970, 15 species of aquatic beetles were collected from this site in a half hour's time, and of the 53 species of aquatic beetles recorded from the swamp 18 have been collected at this site during the course of a summer's work.

## An Annotated List of the Aquatic Beetles of the Dismal Swamp

### FAMILY HALIPLIDAE—The Crawling Water Beetles

This family of small broadly convex beetles is represented by five species in the Dismal Swamp. While poorly adapted for swimming, the members of this group are well equipped for their life of crawling about on the bottom of pools or on the aquatic vegetation at the edge of ponds and streams. They are generally believed to be omnivores and it is probable that secretions on the body surface confer some protection against vertebrate predators.

### Genus *Peltodytes*

*Peltodytes oppositus*: This is the most abundant active haliplid in the swamp, being represented in the collections by 66 specimens. It is found in most of the non-acid waters of the swamp such as the edge of Washington Ditch, in a small willow pond on Jericho Ditch Lane (where it is very abundant) and in temporary rain water pools on the periphery of the swamp. It has been collected at sites 3, 4, 5, 6, 7, 23, and 25.

*Peltodytes muticus*: Often found in association with *P. oppositus* and occupying the same habitat, it may be differentiated from closely related species by the absence of a humeral spot. It is represented by 14 specimens in the collections from sites 3, 4, 5, 10, 24, and 25.

*Peltodytes dunavani*: Represented in the collections by a single specimen which was found in a moderately deep leaf littered pool which had a high population of *Hydroporus lobatus* (collection site 16). Young (7) records a single male from the Dismal Swamp. This is primarily a southern species and the southern Tidewater area probably represents the northern limit of its range.

### Genus *Haliphus*

*Haliphus punctatus*: It is represented by only 7 specimens in the collections, one from site 2 one from site 5, and five from site 24. It is reported from New Jersey to Florida and west to Texas but apparently does not find most areas in the swamp suitable for habitation.

*Haliphus fasciatus*: This species, which is recorded from Massachusetts to Georgia, is represented in the Dismal Swamp material by a single specimen which was collected in a woodland pool, near the margin of the swamp, which had almost completely dried up (site 1).

### FAMILY DYTISCIDAE—The Predaceous Diving Beetles

The family Dytiscidae contains some of the most frequently encountered species of water beetles in the Dismal Swamp. Its members, which are all carnivores, range in size from less than 3mm to 25mm in length. They are well adapted to life in the water and are vigorous swimmers. The family is represented in the swamp by 21 species.

### Genus *Laccophilus*

*Laccophilus fasciatus*: It is often referred to as a pioneer species and is frequently found in newly formed pools where other aquatic beetles have not become established. The species is common in the swamp, being represented by 36 specimens in the collections and is also abundant in other areas of Tidewater; however, while it was collected from sites 1, 3, 7, 8, and 10, the majority of the specimens were found at site 8, a newly formed series of large puddles in Jericho Ditch road. This species was also collected on several occasions when it landed on a yellow car, apparently mistaking the glossy finish for a water surface.

*Laccophilus maculosus*: It is often found in association with *L. fasciatus* and is also considered a pioneer species. It was much less abundant in the swamp, being represented by only 3 specimens, all from site 8, which were taken on three separate occasions several weeks apart.

It should be noted that *L. proximus*, a species which is abundant in Tidewater, being found primarily in water collecting in borrow pits, is not recorded from the Dismal Swamp.

### Genus *Bidessonotus*

*Bidessonotus inconspicuus*: This very small species is undoubtedly more abundant in the swamp than the 36 specimens collected would indicate. The small size, dark coloration and tendency to "play dead" and hide in the leaf litter causes a great many specimens to be overlooked. It seems to be most abundant in the smaller woodland pools which have some vegetation. *B. inconspicuus* is recorded from sites 1, 3, 5, 6, 7, 8, and 11.

*Bidessonotus pulicaris*: This species is very similar to *B. inconspicuus* and is usually found associated with it. It is represented in the Dismal Swamp ma-

terial by eight specimens collected at sites 1, 3, 6, and 11.

### Genus *Uvarus*

*Uvarus* sp.: This genus is represented in the collections by a single specimen of an undetermined species which was collected in a mass of *Myriophyllum* at site 2.

### Genus *Hydroporus*

*Hydroporus lobatus*: It is represented in the collections by 82 specimens, many more having been collected and released. It is one of the few species which can be found in the acid ditches such as Lynn, Jericho, or Middle Ditch, and is usually found behind obstructions or in very slow moving areas. It is most abundant in broad, moderately deep pools with a great deal of leaf litter on the bottom, and is present throughout the year, having been collected at such extreme dates as December 31 and July 24. Collected from sites 4, 6, 8, 12, 13, 14, 15, 16, 17, and 25.

*Hydroporus carolinus*: This species is represented in the collection by 84 specimens and while it is often collected in association with *H. lobatus* it attains its highest densities (densities have been recorded at 132 per sq. ft.) in areas with emergent rooted aquatic vegetation. It has been collected from sites 1, 4, 5, 7, 11, 17, and 23.

*Hydroporus venustus*: While easily recognized by the sharply ascending anterior elytral margin this species exhibits a great variation in color pattern and may be confused with *H. carolinus* upon casual observation. It is represented by 18 specimens in the Dismal Swamp collections, from sites 17, 24, and 25, and seems to be most abundant along the margins of the ditches in the southern part of the swamp. *Hydroporus niger*: This northern species is represented in the Dismal Swamp collection by a single specimen which was collected at site 8. The author has seen no specimens from any other area of Tidewater.

*Hydroporus clypealis*: This species is easily recognized by the sinuate prothoracic margin in the female and the reduced prothoracic claw of the male. The 15 specimens in the Dismal Swamp collections were collected from sites 23, 24, and 25.

*Hydroporus* sp.: The two specimens which represent this record were collected from sites 23 and 25. It is possible that they are small specimens of *H. carolinus*; however, their positive determination will not be possible until more material is available.

### Genus *Agabus*

*Agabus* SP.: This species was never abundant but was regularly encountered in woodland pool situations. The 23 specimens in the Dismal Swamp collection were from sites 3, 8, and 11.

### Genus *Laccornis*

*Laccornis difformis*: This reportedly widespread eastern species is represented in the Dismal Swamp collection by 9 specimens from sites 8 and 11. The

author has never collected it from any other area in Tidewater.

#### Genus *Agabetes*

*Agabetes accuductus*: This is a widespread, primarily northern species, although Young (8) records a single specimen from north central Florida. It is abundant in the Dismal Swamp, (85 specimens in the collections) and is found primarily in woodland pools having been collected at sites 1, 3, 8, 11, and 18.

#### Genus *Copelatus*

*Copelatus caelatipennis princeps*: This southeastern subspecies is rare in the swamp, being represented by only three specimens from collection sites 9 and 11. This is apparently the first record of this species from Virginia, however, it is not a northern record since Young (9) records a single specimen from New Jersey. The Dismal Swamp specimens compare well with material collected in Florida.

*Copelatus glypticus*: This species is abundant throughout the eastern United States and south-eastern Canada. It is represented by 12 specimens in the collections, the majority of which were removed from site 22. It has also been collected at sites 7 and 8.

#### Genus *Copotomus*

*Copotomus interrogatus interrogatus*: This species is most abundant in the larger woodland pools but it can also be collected at the margins of most of the ditches where obstructions create areas of reduced flow. It is represented by 53 specimens in the collections from sites 1, 3, 4, 6, 8, 14, 23, and 24.

#### Genus *Rhantus*

*Rhantus calidus*: This rather uncommon species appears to prefer large woodland pools. It is represented in the collections by 3 specimens from sites 1, 3, and 11.

#### Genus *Hoparius*

*Hoparius planata*: This rare dytiscid is restricted to the woodland pools at the margins of the swamp. The Dismal Swamp collection contains 7 specimens from sites 3 and 8. While it was first reported by Fall in 1927 (10) from Arkansas, this is probably the first Virginia record. Specimens have also been collected from the Stumpy Lake region of Chesapeake, where they were found in a woodland pool.

#### Genus *Dytiscus*

*Dytiscus fasciventris*: This species is recorded from the Dismal Swamp by a single specimen in the Norfolk museum collection which is labeled "White Marsh Road near Jericho Ditch". The author has not collected it in the swamp nor in any part of Tidewater.

#### Genus *Hydacticus*

*Hydacticus bimarginatus*: This is an abundant southeastern species which is well represented in the Dismal Swamp collections (52 specimens). While it was collected at sites 1, 3, 4, 8, 11, 15, and 19, it was

most often found in woodland pools, and was also routinely collected in the thickly vegetated areas of the non-acid ditches.

#### Genus *Acilius*

*Acilius mediatius*: While this species was never collected in large numbers it was frequently encountered and is represented by 53 specimens in the Dismal Swamp collections. It is recorded from sites 1, 2, 4, 5, and 11, but seemed to prefer the larger woodland pools.

#### Genus *Thermonectus*

*Thermonectus basillaris*: This species is found in a variety of situations in the swamp but appears to be primarily a woodland pool species. It is represented in the collections by 27 specimens from sites 1, 3, 8, 15, and 19.

*Thermonectus ornaticollis*: This species is also primarily a woodland pool species and is often taken in association with *T. basillaris* and *A. mediatius*. It is represented in the Dismal Swamp materials by 33 specimens from sites 1, 3, 8, and 17.

#### FAMILY GYRINIDAE—The Wirligig Beetles

This family of fascinating beetles includes the most conspicuous of the aquatic beetles of the swamp. Their surface-dwelling habit and gregarious character quickly draws the attention of even the most casual observer. Most species are quite wary, fast and difficult to collect. Most seem to circle just out of reach and can move so fast over the surface of the water that a quick leap into the water and an energetic swing of the net is the only effective method the author has found for collecting them. Needless to say when the water covers three to four feet of mud (as in site 20) the results of this tactic can be disquieting.

#### Genus *Gyrinus*

*Gyrinus borealis*: A single specimen of the species, which was taken in association with *Gyrinus frosti* and *Dineutus carolinus* at collection site 23 is in the Dismal Swamp collection. It is primarily a northern species but has been collected as far south as Fredericksburg, Virginia (11). If this specimen is the true *borealis* it represents a southern record for the species.

*Gyrinus elevatus*: Young (8) indicated that this species is apparently confined to the southern United States and that the type locality of New York is possibly in error. This is the first recent record of *G. elevatus* north of Georgia. It is represented in the Dismal Swamp collections by a single specimen from site 2.

*Gyrinus frosti*: This species is doubtfully determined as *G. frosti*. I have three specimens collected from sites 20 and 23.

#### Genus *Dineutus*

*Dineutus carolinus*: This species is very abundant in some of the ditches and occasionally in large pools in the swamp. It is the most obvious of the aquatic beetles in the swamp, occurring in large groups in

all but the most barren areas of the interior ditches, but it seems most abundant in Washington ditch and in several small nameless cross ditches at the periphery of the swamp. The Dismal Swamp collection contains 24 specimens from sites 2, 4, 16, 18, and 19.

*Dineutus discolor*: This species always occurs in association with *D. carolinus* in Washington Ditch but is less abundant. It is represented in the Dismal Swamp collection by 15 specimens from sites 2 and 4.

#### FAMILY HYDROCHIDAE

The family Hydrochidae has been established by modern workers to contain the aberrant hydrophiloids which superficially resemble the Dryopidae and Elmidae (8, 12). The genus *Hydrochus* is the only member of this group which occurs in Virginia.

#### Genus *Hydrochus*

*Hydrochus* sp.: This species, which is represented in the Dismal Swamp collection by 14 specimens is apparently restricted to the nonacid waters of the swamp and in fact has been collected from only the very shallow areas of two sites (5 and 10) near the periphery of the swamp.

#### FAMILY HYDROPHILIDAE—The Water Scavenger Beetles

The family Hydrophilidae, a group strongly convex, dark colored beetles includes both the largest and the smallest species of aquatic beetles found in the swamp, ranging in size from 1.5mm to over 30mm. The larvae are ravenous predators, however, the adults are omnivorous and apparently feed primarily on dead or decaying organic matter. It is represented in the Dismal Swamp by 17 species.

#### Genus *Tropisternus*

*Tropisternus blatchleyi blatchleyi*: While this subspecies, as well as the two following, is quite abundant in the Tidewater area it is apparently quite restricted in the swamp. It is represented by 21 specimens in the swamp collections from sites 5 and 8.

*Tropisternus lateralis*: While very abundant in some freshwater situations in the Tidewater area, *T. lateralis* is uncommon in the swamp, being represented by only 4 specimens in the collections from sites 5 and 8.

*Tropisternus mexicanus striolatus*: This is the northern subspecies of a species which is found throughout North and Central America. While it is represented in the collections by only 12 specimens, it is fairly abundant in the swamp being found not only in the temporary nonacid pools, but also in those ditches which are able to support a heavy growth or *Ludwigia* along the margins. It is recorded from sites 8, 10, 15, 18, and 19. The swamp forms of this subspecies appear to be somewhat lighter than *T. mexicanus viridis*, the southern subspecies.

*Tropisternus natator*: This species *T. natator* is represented in the Dismal Swamp collection by a single specimen from site 10. It is not as abundant

as the preceding three species of *Tropisternus* in the Tidewater area. The specimen appears to be typical of the northern specimens of this species rather than exhibiting the southern variations as do the specimens of *T. mexicanus striolatus*.

#### Genus *Hydrophilus*

*Hydrophilus triangularis*: One specimen of this species was collected by J. D. Hatch, Jr., on October 31, 1955, and bears the label "Lake Drummond". This is the only specimen of this species recorded from the Dismal Swamp and is probably the only species of aquatic beetle which lives in Lake Drummond. (See also *Paracymus subcupreus*.)

#### Genus *Hydrochara*

*Hydrochara obtusatus*: It is very abundant in the swamp, appearing to prefer pools of standing water in which a great deal of leaf litter has accumulated. It is represented in the collections by 71 specimens from collection sites 1, 3, 11, and 19.

#### Genus *Berosus*

*Berosus aculeatus*: This species has apparently not been previously recorded from Virginia although the lectotype is from North Carolina, and it has been recorded from both Maryland and Pennsylvania. It is represented in the Dismal Swamp material by 19 specimens from sites 4, 6, 10, and 11.

*Berosus exiguus*: This species is widespread in the eastern United States but apparently, in the Dismal Swamp, it is restricted to roadside puddles of clear water. It is represented in the collections by six specimens from site 10.

*Berosus infuscatus*: This is the commonest of the species of the genus *Berosus* in the Dismal Swamp, being represented by 41 specimens in the collections. It is found in most shallow nonacid pools but in addition also appears to be established in the ditches which are able to support a good growth of *Ludwigia*. It is recorded from collection sites 3, 6, 8, 9, and 10. *Berosus peregrinus*: This widely distributed species is represented by only 3 specimens in the Dismal Swamp collections from sites 6 and 7. It is easily confused with *B. aculeatus* and great care must be exercised in separating it.

#### Genus *Paracymus*

*Paracymus subcupreus*: The small size of the members of this genus make them very difficult to identify, and undoubtedly, also result in many specimens being missed in the field. The only species of the genus which has been collected in the Dismal Swamp to date, *P. subcupreus*, is represented by three specimens from sites 6 and 11. It may be separated from all other aquatic beetles found in the swamp by its small size, convex shape and by the metallic black dorsum. A single specimen bearing the locality label "Lake Drummond, June 8, H. S. Barber" is in the U. S. National Museum Collection. The author has collected this species at the mouth of Jericho Ditch where it enters Lake Drummond (between the union of Jericho Ditch and Washington Ditch and Lake Drummond, site 6) but never in the lake.

In all probability this lable is referring to the general locality of the lake rather than the lake itself.

**Genus Enochrus**

*Enochrus cinctus*: This species is very similar to *E. consortus*, but may be separated on the basis of the slightly smaller size and the darker margins of the pronotum and elytra. It is represented in the Dismal Swamp collections by a single specimen from site 8. *Enochrus consortus*: This is the most abundant species of the genus Enochrus in the Dismal Swamp, being represented in the collections by 7 specimens from sites 2 and 3. It is the largest member of the genus in this area.

*Enochrus sublongus*: This small species is represented by a single specimen from site 4 in the Dismal Swamp collections. It is very similar to the following species, *E. ochraceus*, but it may be distinguished on the basis of size, and the pale epiplura.

*Enochrus ochraceus*: While this species occasionally reaches high densities in some areas of Tidewater, (the author has collected 50 specimens in a matter of a few minutes from a large drying pool full of soggy rotten leaves at Sea Shore State Park) it is not abundant in the Dismal Swamp, even though apparently favorable aquatic situations do exist there. It is represented in the Dismal Swamp collections by 3 specimens and these were collected in the rather atypical situation (for it) of a roadside pool, site 8.

**Genus Helocombus**

*Helocombus bifidus*: This species is superficially quite similar to the larger members of the genus *Enochrus* but may be easily separated on the basis of the four segmented middle and hind tarsi and the maxillary palps. The three specimens from site 3 in the Dismal Swamp are the only specimens recorded from the Tidewater area; however, the species has also been collected from Ft. Monroe, Virginia.

**Genus Cymbiodyta**

*Cymbiodyta blanchardi*: The 5 specimens from the Dismal Swamp were all collected at site 2, in a shallow section of Washington Ditch with a heavy growth of Ludwigia.

*Cymbiodyta vindicata*: Although it is recorded as being common from Canada to Texas only a single specimen, from the margin of site 1 is present in the Dismal Swamp collections.

**FAMILY LIMNEBIIDAE—The Minute Moss Beetles**

Members of this family are separated from the Hydrophilidae on the basis of larval characters. It is represented in the Dismal Swamp by a single species.

**Genus Hydraena**

*Hydraena marginicollis* or *penmsylvanica*: Three specimens were collected from a water filled rut in a woodland road near the periphery of the swamp,

site 1. Since is is small it might be easily overlooked and probably is more abundant than these collection records indicate.

**DISCUSSION**

Of the 53 species of aquatic beetles recorded from the Dismal Swamp, 12 species are represented by a single specimen and 12 additional species by from 2 to 5 specimens in the Dismal Swamp collection. An examination of the distribution of the aquatic beetles in the swamp indicates that few species are able to live in the most typical parts of the swamp and that most of the species recorded from the swamp are invaders ekeing out a marginal existence at best.

Most of the "common" species are really quite restricted in habitat, being confined to the woodland pools or nonacid ditches on the periphery of the swamp. Only 7 species, *Hydroporus carolinus*, *H. lobatus*, *H. venustus*, *H. clypealis*, *Copelatus glyphicus*, *Coptotomus i. interrogatus* and *Dineutus carolinus* can be consistantly found in the "typical" aquatic situations within the swamp.

While there is no direct evidence available on the limiting factors involved in the restriction of aquatic beetle populations in the swamp there is some indications that water pH may play an important role. Certainly wherever waters of reduced acidity occur in the swamp a dramatic change in both species composition and numbers in the aquatic beetle populations is seen.

Representatives of the family Noteridae have not been recorded from the Dismal Swamp, but several species have been collected from the upper Northwest River, an area just to the east. The Berosine Hydrophilid, *Derallus altus*, which is recorded from the Northwest River is also missing from the swamp collections. This is somewhat surprising since the Northwest River was probably an integral part of the Dismal Swamp drainage system prior to the construction of the Dismal Swamp Canal and US Route 17.

Collections in the eastern portion of the Dismal Swamp have been quite limited (see Figure 1). Access to this area is difficult and has resulted in a less than satisfactory representation of the area in the collections. It is possible, however, that an intensive survey of those areas just west of the Dismal Swamp Canal would add several additional species to those already recorded from the swamp, including those presently recorded from the upper Northwest River.

**Acknowledgment**

The author wishes to express his appreciation to his colleagues in the Department of Biology for their help and encouragement and particularly to Dr. Gerald Levy for his constructive criticism of the manuscript. This study was supported, in part, by a grant from the Virginia Academy of Science and, in part, by the Old Dominion University Research Foundation.

**References**

1. Murray, J. J., *Va J. Sci.*, **20**, 158 (1969).

2. Dean, G. W., *Va J. Sci.*, **20**, 166 (1969).

3. Henry, E. F., *Va J. Sci.*, **21**, 41 (1970).

4. Ramsey, E. W., Hinkle, R. and Benander, L. E., *Va J. Sci.*, **21**, 81 (1970).

5. Andrews, J. D., *Va. J. Sci.*, **22**, 5 (1971).

6. Gurney, A. B., *J. Wash. Acad. Sci.*, **53**, 57 (1963).

7. Young, F. N., *Ann. Ent. Soc. Amer.*, **54**, 214 (1961).

8. Young, F. N., *The Water Beetles of Florida*, University of Florida Press, Gainesville, 1954, p. 38.

9. Young, F. N., *J. Fla Acad. Sci.*, **26**, 56 (1963).

10. Fall, H. C., *J. N. Y Ent. Soc.*, **35**, 177 (1927).

11. Fall, H. C., *Trans. Am. Ent Soc*, **47**, 269 (1922).

12. Woolbridge, D. P., *Trans. Ill Acad. Sci.*, **58**, 205 (1965).