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ADULT CADDISFLIES (TRICHOPTERA) FROM HOUGHTON CREEK, OGEMAW COUNTY, MICHIGAN

by

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This paper contains records of adult caddisflies collected from Houghton Creek, Ogemaw County, Michigan between September 1950 and December 1953. Included are records of seasonal and geographic distribution, notes on comparative abundance of the different species, and incidental observations on some species.

Houghton Creek is a major tributary of the Rifle River, where an extensive watershed development program was begun in 1950 (Tody and Clark, 1951; Clark, 1953). It is anticipated that physical changes such as stabilization of stream flows, alteration in substrate, and lowering of summer water temperatures will result from this program. The present study is part of a biological inventory made to obtain a record of the abundance and distribution of the bottom fauna at the time of the

watershed development[1] to provide basic information against which future changes can be measured.

Acknowledgments

The field work and laboratory identification were done while I was employed on a research fellowship with the Institute for Fisheries Research of the Michigan Department of Conservation. The early planning and field work were done under the guidance of Dr. J. W. Leonard of the Michigan Conservation Department and the late Dr. J. S. Rogers of The University of Michigan Museum of Zoology. Later phases were supervised by Dr. F. F. Hooper of the Institute and Dr. T. H. Hubbell of the Museum of Zoology. Mr. Stanley G. Jewett, Jr. and Dr. Paul H. Eschmeyer read the manuscript and offered helpful comments. Mr. Paul M. Earl drafted the figures.

Identification of material

The regional study of Ross (1944) refers to and illustrates most of the species of caddisflies identified in the present study. The nomenclature used is that of Ross (1944 and 1956). The work of Leonard and Leonard (1949a and b) supplied additional information on the caddisflies in Michigan trout streams in particular, and was the basis for determining previous county collection records.

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[1] Ellis, Robert J. 1959. An inventory of physical and chemical conditions and bottom fauna in Houghton Creek, Ogemaw County, during watershed improvement. Inst. Fish. Res., Rept. No. 1538 (unpublished).

Dr. and Mrs. J. W. Leonard verified and occasionally identified samples of the author's material. Responsibility for correct identification of the large number of specimens is, of course, my own.

The study area

Houghton Creek is a trout stream 10.4 miles in length. It originates from springs and seepage in white cedar swamps and gradually increases in volume from approximate flows (in October 1953) of 6 c.f.s. at Site 1 (Fig. 1) to 15 c.f.s. at Site 5, 16 c.f.s. at Site 6, and 35 c.f.s. below the junction with Wilkens Creek.[2] Water temperatures varied only about 3° F. between the headwaters and the mouth of the stream; the summer maximum during this study was about 67° F. and the winter minimum was slightly below 32° F. The pH of 8.4 and methyl orange alkalinity of about 180 p.p.m. were essentially the same from Site 1 to Site 15. Organic enrichment from a sewer just below Site 6 increased the soluble and total phosphorus (but not total nitrogen) from Site 7 to the mouth of the stream.

From the origin of the stream through Site 10 the stream is essentially a series of gravelly riffles and pools. Below Site 10, quiet, deep water with sand or clay bottom predominates. Vascular aquatic plants were much more prevalent below Site 10 than above.

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[2] During the extensive field work on Houghton Creek, new site designations were added serially when needed without regard to location along the section of stream studied. For convenience in referring to Figure 1 and in orienting collection localities, the original site designations (those appearing on collection labels, field notes, and in previous reports) have been changed so that sites are numbered consecutively from the farthest upstream site (No. 1) to the mouth (No. 15). In the following list of changes, the new site number (used in this paper) is followed by its original designation: 1=1, 2=14, 3=2, 4=3, 5=4, 6=15 (Rose City bridge), 7=5, 8=6, 9=7, 10=13, 11=8, 12=9, 13=10, 14=12, 15=11.

Figure 1. --Map of Houghton Creek showing collection sites and localities of special interest in this study.

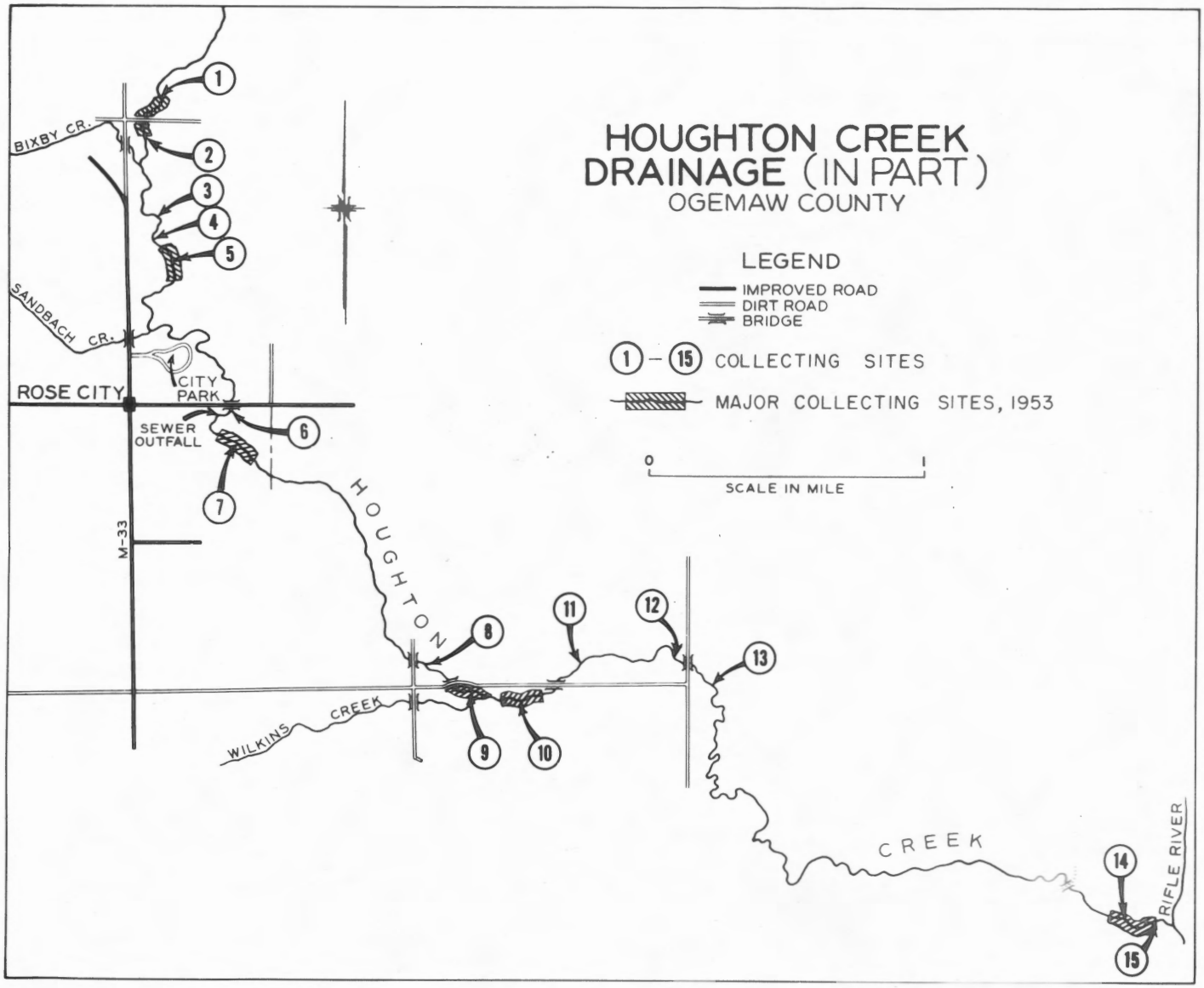
HOUGHTON CREEK
DRAINAGE (IN PART)
OGEMAW COUNTY
LEGEND
IMPROVED ROAD
DIRT ROAD
BRIDGE
1 – 15 COLLECTING SITES
MAJOR COLLECTING SITES, 1953
0
SCALE IN MILE
BIXBY CR.
SANDBACH CR.
ROSE CITY
CITY PARK
SEWER OUTFALL
M-33
HOUGHTON
CREEK
WILKINS
CREEK
RIFLE RIVER
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Figure 1

In addition to the major tributaries indicated in Figure 1, several temporary or permanent spring seepages and ponds occurred within insect flight range of stream collecting sites and undoubtedly some specimens which were collected originated from these extraneous sources.

Additional details concerning physical and chemical conditions and the stream fauna have been published (Ellis and Gowing, 1957; Ellis, 1961; see also footnote No. 1).

Methods

From September 1950 to January 1953 the collecting of adult insects was done incidental to other work. In 1953, after the spring emergences began, a sampling schedule was established which called for collecting 6 days a week at 2 locations each day, from a total of 6 locations. (Sites 1 to 2, 5, 7, 9, 10, and 14 to 15--see Fig. 1 for locations.) Sampling on a given day was done at adjacent pairs of sites, such as 1 to 2 and 5, or 7 and 9, to minimize travel between sites. These six sites were chosen and their extent determined with the objective of including the typical stream habitats of that general section of stream.

The collecting methods included daytime and evening sweeping of the streamside vegetation with an air net; air-net collecting from observable flights; hand picking with flash light; hand picking of forms attracted to a gasoline lantern and lighted windows; and operation of electric light traps powered with portable generators.

Systematic light-trap operation was initiated on May 14, 1953 at sites 2 and 5. The minimum air temperature recorded along the stream

that night was 29° F. Systematic light-trap operations were discontinued after September 10 because of low evening air temperatures and the resulting lack of insect flights. The base of operations in 1952 and 1953 was Site 5, where a light trap was generally operated when not in use elsewhere.

About 300 collections of adult aquatic insects were made by all methods from 1950 through 1952. In 1953 about 240 collections were made with a light trap and 480 by other means. These totals for both collecting periods include a few adults which were reared from nearly mature nymphs and pupae.

The collection is presently housed at The Academy of Natural Sciences of Philadelphia.

A total of 9,055 specimens of Trichoptera were examined. These represented 12 families, 39 genera, and 85 species. Included are 4 species not definitely identified but given letter designations as a convenience in recording. The seasonal distribution of the species is shown in Figure 2.

In the following catalog of the species found, the collection sites are those of Figure 1. The figure in parentheses following the site number is the number of collections from each site which contained that species. An asterisk following a species name indicates a new county record for the species. The species are numbered consecutively and the number arbitrarily assigned to each species is identical to that given in the listing of seasonal occurrence in Figure 2.

Figure 2. --Seasonal distribution of adult caddisflies on Houghton Creek.

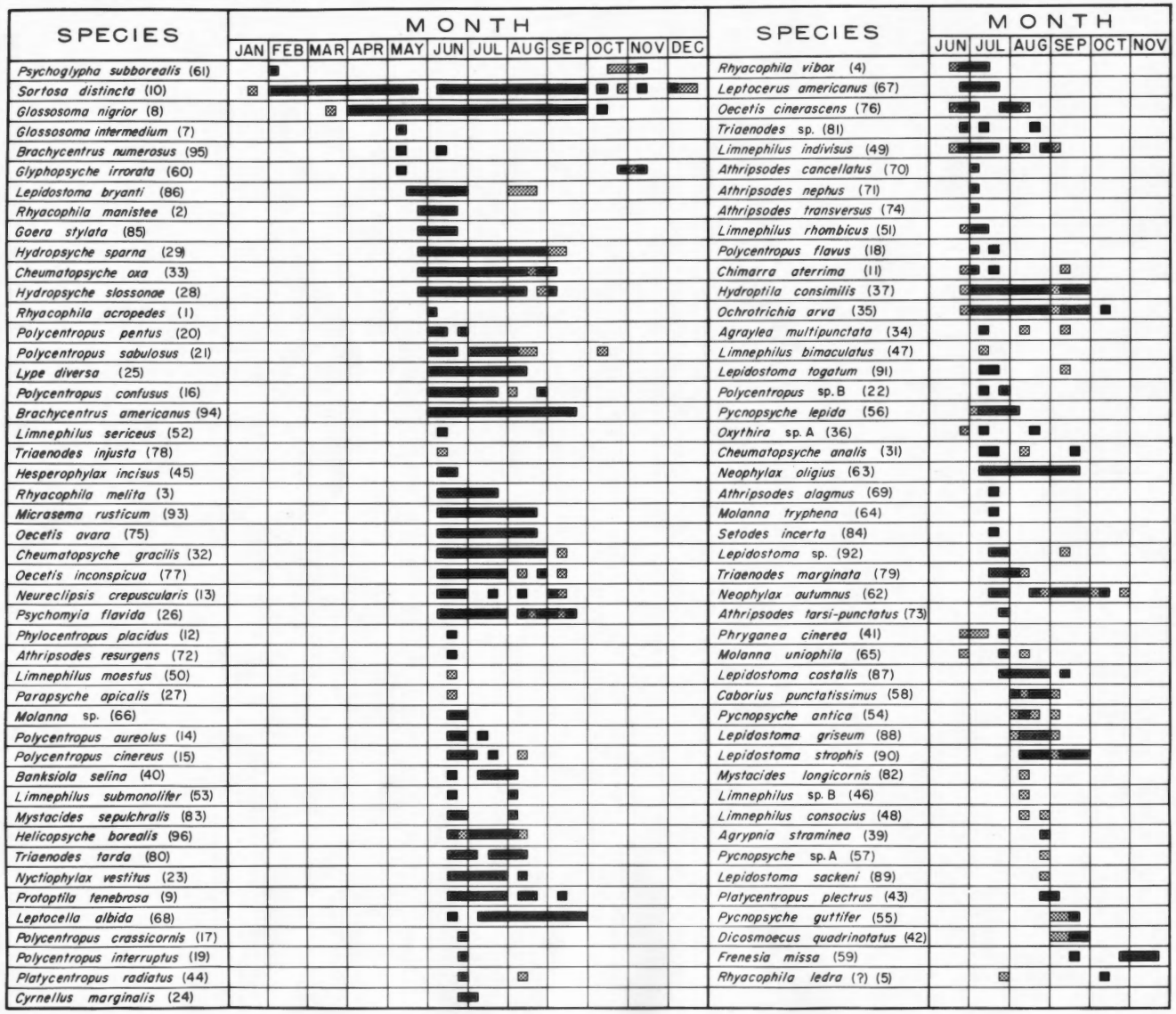
INDICATES OCCURRENCE IN 1953 ONLY OR 1953 & 1950-1952.
INDICATES OCCURRENCE ONLY IN 1950-1952.
SPECIES
MONTH
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Psychoglypha subborealis (61)
Sortosa distincta (10)
Glossosoma nigrior (8)
Glossosoma intermedium (7)
Brachycentrus numerosus (95)
Glyphopsyche irrorata (60)
Lepidostoma bryanti (86)
Rhyacophila manistee (2)
Goera stylata (85)
Hydropsyche sparna (29)
Cheumatopsyche oxa (33)
Hydropsyche slossonae (28)
Rhyacophila acropedes (1)
Polycentropus pentus (20)
Polycentropus sabulosus (21)
Lype diversa (25)
Polycentropus confusus (16)
Brachycentrus americanus (94)
Limnephilus sericeus (52)
Triaenodes injusta (78)
Hesperophylax incisus (45)
Rhyacophila melita (3)
Micrasema rusticum (93)
Oecetis avara (75)
Cheumatopsyche gracilis (32)
Oecetis inconspicua (77)
Neureclipsis crepuscularis (13)
Psychomyia flavida (26)
Phylocentropus placidus (12)
Athripsodes resurgens (72)
Limnephilus moestus (50)
Parapsyche apicalis (27)
Molanna sp. (66)
Polycentropus aureolus (14)
Polycentropus cinereus (15)
Banksiola selina (40)
Limnephilus submonolifer (53)
Mystacides sepulchralis (83)
Helicopsyche borealis (96)
Triaenodes tarda (80)
Nyctiophylax vestitus (23)
Protoptila tenebrosa (9)
Leptocella albida (68)
Polycentropus crassicornis (17)
Polycentropus interruptus (19)
Platycentropus radiatus (44)
Cyrnellus marginalis (24)
SPECIES
MONTH
JUN JUL AUG SEP OCT NOV
Rhyacophila vibox (4)
Leptocerus americanus (67)
Oecetis cinerascens (76)
Triaenodes sp. (81)
Limnephilus indivisus (49)
Athripsodes cancellatus (70)
Athripsodes nephus (71)
Athripsodes transversus (74)
Limnephilus rhombicus (51)
Polycentropus flavus (18)
Chimarra aterrima (11)
Hydroptila consimilis (37)
Ochrotrichia arva (35)
Agraylea multipunctata (34)
Limnephilus bimaculatus (47)
Lepidostoma togatum (91)
Polycentropus sp. B (22)
Pycnopsyche lepida (56)
Oxythira sp. A (36)
Cheumatopsyche analis (31)
Neophylax oligius (63)
Athripsodes alagmus (69)
Molanna tryphena (64)
Setodes incerta (84)
Lepidostoma sp. (92)
Triaenodes marginata (79)
Neophylax autumnus (62)
Athripsodes tarsi-punctatus (73)
Phryganea cinerea (41)
Molanna uniophila (65)
Lepidostoma costalis (87)
Caborius punctatissimus (58)
Pycnopsyche antica (54)
Lepidostoma griseum (88)
Lepidostoma strophis (90)
Mystacides longicornis (82)
Limnephilus sp. B (46)
Limnephilus consocius (48)
Agrypnia straminea (39)
Pycnopsyche sp. A (57)
Lepidostoma sackeni (89)
Platycentropus plectrus (43)
Pycnopsyche guttifer (55)
Dicosmoecus quadrinotatus (42)
Frenesia missa (59)
Rhyacophila ledra (?) (5)

Figure 2

Family RHYACOPHILIDAE

1. Rhyacophila acropedes Banks*

   A single specimen of this species was collected.

   June 2, 1953, Site 2: 1 male.

2. Rhyacophila manistee Ross

   1951, 1 collection, June 17: 2 males.

   1953, 9 collections from May 26 to June 17: 29 males.

   Collection site 1951: 11(1).

   Collection sites 1953: 7(1), 9(5), 10(3).

   A single individual occurred in light trap collections.

3. Rhyacophila melita Ross*

   1952, 7 collections from June 19 to July 17: 9 males.

   1953, 9 collections from June 12 to July 20: 10 males.

   Collection sites 1952: 1(1), 2(4), 5(2).

   Collection sites 1953: 1(2), 2(2), 5(4), 10(1).

   This species seems to be associated with the upper half of the stream (above Wilkens Creek). The single specimen from below this point was in a light-trap collection from Site 10.

4. Rhyacophila vibox Milne*

   1952, 1 collection, June 20: 1 male.

   1953, 3 collections from June 29 to July 13: 4 males.

   Collection site 1952: 1(1).

   Collection site 1953: 1(3).

5. Rhyacophila ledra Ross[3]

1952, 1 collection, July 31: 1 male, Site 1.

1953, 1 collection, October 12: 1 male, Site 2.

6. Rhyacophila females (not identified to species)

1951-52, 9 collections, June 19 to July 17: 10 females.

1953, 11 collections, June 2 to July 6: 37 females.

Individuals of the genus Rhyacophila were rare in light-trap collections. Of a total of 35 collections containing this genus, only 3 were from light traps and only 4 collections were from below Site 9 (4 from Site 10).

Family GLOSSOSOMATIDAE

7. Glossosoma intermedium (Klapalek)*

1953, Site 1, May 14: 1 male with air net.

8. Glossosoma nigrior Banks

1951-52, 42 collections from March 15 to September 15: 44 males and 53 females.

1953, 174 collections from April 1 to October 12: 418 males, 570 females.

Collection sites 1951-52: 1(4), 2(16), 3(2), 5(9), 6(4), 8(2), 10(3), 11(1), 15(1).

Collection sites 1953: 1(20), 2(33), 5(29), 6(2), 7(20), 9(30), 10(20), 14(7), 15(13).

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[3] Identification "probable."

This species was well distributed over the entire study area and season with a possible peak in abundance from June 20 to July 20 in 1953. Males and females seemed to be attracted about equally to the light trap, but both sexes were more frequent in collections made with the air net than the light trap. In April this species was commonly collected from stones along the water's edge.

9. Protoptila tenebrosa (Walker)

1952, 1 collection, June 28: 1 male.

1953, 22 collections from June 17 to September 8: 69 males and 40 females.

Collection site 1952: 6(1).

Collection sites 1953: 1(2), 5(5), 7(7), 9(1), 10(4), 15(3).

P. tenebrosa was never taken in light traps. The peak of abundance was from July 6 to July 23, in 1953. Egg counts for each of 4 females collected July 6 were 100, 105, 110, and 140.

Family PHILOPOTAMIDAE

10. Sortosa distincta (Walker)*

Adults of this species were collected in every month of the year.

1950-52, 68 collections, from January 17 to December 15: 341 males, 23 females.

1953, 125 collections, from February 3 to December 7: 577 males, 62 females. Collection sites 1950-52: 1(5), 2(30), 3(2), 4(3), 5(12), 6(11), 10(1), 12(1), unspecified (3).

Collection sites 1953: 1(21), 2(30), 3(2), 4(1), 5(31), 6(8), 7(6), 9(4), 10(18), 11(1), 14(2), 15(1).

This species commonly produces wingless females during the winter months (Ross, 1944). The number of wingless individuals and months of collection were March (9), April (1), May (1), July (1), and in December (1). This species was about equally abundant in the collections throughout the year. Although collected from all sites, the species was most abundant in collections from Site 10 and upstream. Air net and light traps seemed about equally effective during the period when the latter were operated.

11. Chimarra aterrima Hagen*

1952, 2 collections, June 23 and September 9: 1 male, 1 female.

1953, 2 collections, July 6 and July 16: 2 males.

Collection sites 1952: 5(1), 6(1),

Collection site 1953: 1(2).

Family PSYCHOMYIIDAE

12. Phylocentropus placidus (Banks)*

1953, 1 collection, June 19-21: 2 males, Site 5, light trap.

13. Neureclipsis crepuscularis (Walker)

1952, 1 collection, September 9: 1 male.

1953, 6 collections, June 11 to September 2: 4 males, 6 females.

Collection site 1952: 15(1).

Collection sites 1953: 2(1), 14(1), 15(4).

This species occurred at each end of the study area but not in the intervening area and only once in light-trap collections.

14. Polycentropus aureolus (Banks)*[4]

1953, 3 collections, June 19 to July 14: 5 males, 4 females.

Collection sites 1953: 5(1), 9(2).

This species occurred only in light-trap collections.

15. Polycentropus cinereus Hagen

1951-52, 3 collections, June 17 to August 11: 1 male, 2 females.

1953, 5 collections, from June 15 to July 18: 5 females.

Collection sites 1951-52: 11(1), 12(1), 15(1).

Collection sites 1953: 1(1), 5(2), 10(1), 14(1).

This species occurred in air-net and light-trap collections.

16. Polycentropus confusus Hagen*

1951-52, 4 collections, June 30 to August 3: 3 males, 3 females.

1953, 19 collections, June 6 to August 25: 19 males, 14 females.

Collection sites 1951-52: 9(1), 10(1), 12(1), 14(1).

Collection sites 1953: 5(1), 7(2), 9(7), 10(4), 14(4), 15(1).

All but 4 individuals taken in 1953 were in light traps. One female contained 379 eggs. Only 5 individuals were collected upstream from Site 9.

17. Polycentropus crassicornis Walker*

1953, 1 collection, June 30: 2 males, Site 9, from a light trap.

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[4] Identification "probable."

18. Polycentropus flavus (Banks)*

1953, 2 collections, July 4 and 15: 2 females, Sites 10 and 14, both from light traps.

19. Polycentropus interruptus (Banks)*

1953, 3 collections, June 24 to June 30: 1 male, 4 females.

Collection sites 1953: 5(1), 7(1), 9(1).

All specimens were from light-trap material. One female yielded 224 eggs.

20. Polycentropus pentus Ross*

1952, 1 collection, June 28: 1 male.

1953, 4 collections, June 3 to June 29: 8 males, 1 female.

Collection site 1952: 6(1).

Collection sites 1953: 2(1), 5(2), 10(1).

All collections were from Site 10 and above and all the 1953 collections were from light traps.

21. Polycentropus sabulosus Leonard and Leonard*

1951-52, 5 collections, June 3 to September 9: 1 male, 4 females.

1953, 20 collections, June 3 to August 3: 15 males, 15 females.

Collection sites 1951-52: 5(1), 6(1), 8(1), 14(1), 15(1).

Collection sites 1953: 1(1), 2(4), 5(3), 7(1), 9(4), 10(4), 14(2), 15(1).

The identification of the females of this species is only probable. Light traps were much more effective than the air net in capturing this species.

22. Polycentropus sp. "B"

This may be a new species, but is similar to P. remotus.

1953, 2 collections, July 14 and 31: 2 males, 1 female.

Collection sites 1953: 7(1), 9(1).

Both collections were from light traps.

23. Nyctiophylax vestitus (Hagen)

1952, 3 collections, June 26 to July 21: 1 male, 3 females.

1953, 21 collections, June 19 to August 11; 11 males, 55 females.

Collection sites 1952: 6(1), 10(1), 15(1).

Collection sites 1953: 2(1), 5(3), 7(3), 9(5), 10(3), 14(5), 15(1).

All collections except 1 were from light traps and were fairly evenly distributed over the time period June 19 to July 29 with a single collection occurring after July 29.

24. Cyrnellus marginalis (Banks)*

1953, 4 collections, June 30 to July 4: 3 males, 1 female.

Collection sites 1953: 9(1), 10(1), 14(2).

All collections were from light traps.

25. Lype diversa (Banks)

1951-52, 19 collections, June 15 to August 5: 18 males, 16 females.

1953, 65 collections, June 2 to August 11: 207 males, 94 females.

Collection sites 1951-52: 1(2), 2(4), 6(2), 10(5), 12(2), 15(4).

Collection sites 1953: 1(11), 2(8), 5(9), 7(4), 9(12), 10(11), 14(1), 15(9).

About 2 out of every 3 collections in 1953 were with air net.

Collections were distributed evenly over the study area.

26. Psychomyia flavida Hagen

1951-52, 13 collections, June 23 to September 9: 44 females.

1953, 40 collections, June 11 to September 18: 152 females.

Collection sites 1951-52: 2(2), 5(4), 6(3), 10(1), 12(1), 15(2).

Collection sites 1953: 1(1), 2(3), 5(9), 7(6), 9(3), 10(6), 14(6), 15(1).

This species was much more abundant in light-trap material than in air-net collections and was equally distributed over the study area. A single female yielded 24 eggs. Leonard and Leonard (1949b) reported a ratio of 1 male to 50 females in their collections from Michigan and the present study yielded 196 females and no males.

Family HYDROPSYCHIDAE

27. Parapsyche apicalis (Banks)*

1952, 1 collection, June 20: 1 male, Site 1.

28. Hydropsyche slossonae Banks

1951-52, 13 collections, June 13 to August 25: 18 males.

1953, 47 collections, May 24 to September 6: 64 males.

Collection sites 1951-52: 1(1), 2(1), 5(1), 10(3), 15(7).

Collection sites 1953: 1(2), 2(8), 5(4), 7(2), 9(8), 10(5), 14(13), 15(6).

29. Hydropsyche sparna Ross

1952, 9 collections, June 30 to September 9: 20 males.

1953, 60 collections, May 27 to August 31: 82 males.

Collection sites 1951-52: 5(4), 8(2), 10(2), 12(1).

Collection sites 1953: 1(4), 2(16), 5(15), 7(4), 9(9), 10(8), 14(1), 15(3).

Although both Hydropsyche slossonae and H. sparna occurred over the entire study area, slossonae was more abundant in the lower half of the stream (below Site 9), and sparna was more abundant above Site 9.

30. Hydropsyche females

Female Hydropsyche could not be reliably separated to species and the following material was assigned to the genus only.

1951-52, 43 collections, June 3 to September 9: 199 females.

1953, 150 collections, May 20 to September 29: 1,775 females.

Hydropsyche exhibited a marked positive phototaxis and was the most common caddisfly in the light traps from late May to the first week in September. Female Hydropsyche appeared in only 42 air-net collections while appearing in 193 light-trap collections.

31. Cheumatopsyche analis (Banks)

1951, 1 collection, August 11: 1 female.

1953, 3 collections, July 14 to September 17: 2 males, 1 female.

Collection site 1951: 15(1).

Collection sites 1953: 1(1), 2(1), 7(1).

32. Cheumatopsyche gracilis (Banks)*

1951-52, 7 collections, June 15 to September 9: 1 male, 18 females.

1953, 26 collections, June 11 to August 31: 12 males, 37 females.

Collection sites 1951-52: 5(1), 10(2), 15(4).

Collection sites 1953: 1(1), 2(1), 5(3), 7(4), 9(4), 10(2), 14(5), 15(6).

Egg counts from 2 females were 226 and 385 each.

33. Cheumatopsyche oxa Ross*

1952, 6 collections, June 19 to August 20: 2 males, 5 females.

1953, 37 collections, May 27 to September 3: 43 males, 46 females.

Collection sites 1952: 1(1), 5(1), 10(1), 15(3).

Collection sites 1953: 2(5), 5(9), 7(10), 9(1), 14(8), 15(4).

The Cheumatopsyche were similar to the Hydropsyche in being strongly positively phototaxic; 42 of the 63 collections in 1953 were from light traps.

Family HYDROPTILIDAE

34. Agraylea multipunctata Curtis*

1951-52, 2 collections, August 11 and September 9: 1 male, 1 female.

1953, 1 collection, July 14: 1 female.

Collection sites 1951-52: 5(1), 15(1).

Collection site 1953: 9(1).

All collections were from light trap or lantern.

35. Ochrotrichia arva (Ross)*

1951-52, 6 collections, June 30 to September 5: 4 males, 12 females.

1953, 40 collections, July 1 to October 12: 63 males, 115 females.

Collection sites 1951-52: 7(1), 8(1), 9(2), 12(1), 15(1).

Collection sites 1953: 1(2), 2(5), 7(7), 9(11), 10(10), 14(1), 15(4).

Only 3 of these collections were from light traps, the remainder were from air-net collections or reared (1 male).

36. Oxyethira sp. A

1952, 1 collection, June 28: 1 male.

1953, 2 collections, July 14 and August 15: 4 males.

Collection site 1952: 15(1).

Collection sites 1953: 9(1), 10(1).

37. Hydroptila consimilis Morton*

1951-52, 5 collections, June 28 to September 9: 13 males, 15 females.

1953, 27 collections, July 6 to September 29: 24 males, 26 females.

Collection sites 1951-52: 2(1), 5(2), 8(1), 15(1).

Collection sites 1953: 1(1), 7(9), 9(5), 10(6), 14(1), 15(5).

Six of the total of 32 collections were from light-trap material.

38. Hydroptilidae females

Female Hydroptilidae are difficult to assign to species and the following material was assigned to family only.

1951-52, 2 collections, August 11 and August 19: 31 females.

1953, 29 collections, June 3 to September 18: 85 females.

All except 1 of these collections were from light traps.

Family PHRYGANEIDAE

39. Agrypnia straminea Hagen*

1953, 1 collection, August 25, Site 9: 1 female from a light trap.

40. Banksiola selina Betten*

1952, 2 collections, July 10 and 13: 1 male, 1 female.

1953, 5 collections, June 19 to August 1: 3 males, 2 females.

Collection sites 1952: 5(1), 10(1).

Collection sites 1953: 5(1), 9(3), 14(1).

All specimens were from light-trap or lantern collections.

This species was collected over most of the study area (Sites 5 to 14) but was apparently rare.

41. Phryganea cinerea Walker*

1952, 4 collections, June 29 to July 11: 3 males, 1 female.

1953, 1 collection, July 31: 1 male.

Collection sites 1952: 5(3), 6(1).

Collection site 1953: 7(1).

All specimens were from light-trap or lantern collections.

Family LIMNEPHILIDAE

42. Dicosmoecus quadrinotatus (Banks)*

1952, 2 collections, September 5 and 9: 1 male, 2 females.

1953, 4 collections, September 17 to 29: 3 males, 1 female.

Collection sites 1952: 5(1), 10(1).

Collection sites 1953: 9(2), 14(1), 15(1).

Leonard and Leonard (1949b) refer to this as a rare species. The 4 1953 collections were made with air net.

43. Platycentropus plectrus Ross*

1951-52, 4 collections, August 23 to September 6: 4 females.

1953, 2 collections, August 26 to September 3: 2 males.

1951-52 collection sites: 5(3), 12(1).

1953 collection sites: 2(1), 5(1).

Five of the 6 collections were from light sources (the source of the sixth was not recorded).

44. Platycentropus radiatus (Say)*

1951, 1 collection, August 11: 1 female, Site 15.

1953, 1 collection, June 29: 1 female, Site 5.

Both collections were from light sources.

45. Hesperophylax incisus Banks*

1953, 2 collections, June 12 and 15: 2 males, Sites 2 and 5, both from light traps.

46. Limnephilus sp. B

1951, 1 collection, August 11: 1 male, Site 15, from light source.

47. Limnephilus bimaculatus Walker

1952, 2 collections, July 10 and 12: 1 male, 1 female, both from Site 5, from light source.

48. Limnephilus consocius Walker

1951-52, 2 collections, August 11 and 31: 4 males, Sites 5 and 15 from light traps.

49. Limnephilus indivisus Walker*

1951-52, 5 collections, June 20 to September 5: 5 males.

1953, 7 collections, June 30 to August 24: 5 males, 4 females.

Collection sites 1951-52: 1(1), 2(1), 5(2), 15(1).

Collection sites 1953: 1(1), 2(1), 5(1), 7(2), 9(2).

Air net and light trap were about equally effective in collecting this species.

50. Limnephilus moestus Banks*

1952, 1 collection, June 20: 1 female, above Site 1, with an air net.

51. Limnephilus rhombicus (Linnaeus)*

1952, 1 collection, June 28: 1 female.

1953, 2 collections, July 1 and 13: 2 females.

Collection site 1952: 5(1).

Collection sites 1953: 1(1), 14(1).

Two specimens were from lights and the third from an air-net collection.

52. Limnephilus sericeus (Say)*

1953, 1 collection, June 11: 1 male, Site 10.

Leonard and Leonard (1949b) found this to be the most prevalent species of Limnephilus along the Au Sable River in 1948 but it was rare in the present study.

53. Limnephilus submonilifer Walker

1953, 5 collections, June 16 to August 6: 4 males, 1 female.

Collection sites 1953: 1(1), 5(2), 7(1), 9(1).

Four specimens were from light traps and 1 from an air-net collection.

A large nematode was found in the abdomen of 1 male.

54. Pycnopsyche antica (Walker)*

1951-52, 3 collections, August 4 to September 2: 3 males.

1953, 1 collection, August 12: 1 male.

Collection sites 1951-52: 5(1), 8(1), 12(1).

Collection site 1953: 2(1).

Three specimens were from light traps and 1 from an air-net collection.

55. Pycnopsyche guttifer (Walker)*

1951-52, 4 collections, September 2 to 9: 6 males, 5 females.

1953, 1 collection, September 18: 1 male.

Collection sites 1951-52: 5(1), 10(1), 12(1), 15(1).

Collection site 1953: 4(1).

Three collections were made by light traps, 1 by air net, and 1 method was not recorded.

56. Lycnopsyche lepida (Hagen)*

1952, 12 collections, July 1 to 31: 12 males, 6 females.

1953, 14 collections, July 8 to August 7: 9 males, 7 females.

Collection sites 1952: 2(1), 5(5), 7(1), 8(1), 10(4).

Collection sites 1953: 2(2), 5(2), 9(3), 10(1), 14(5), 15(1).

All but 1 of the 1953 collections were from light traps.

57. Lycnopsyche sp. A

1952, 1 collection, August 23: 1 male, Site 5, from a lighted window.

58. Caborius punctatissimus (Walker)*

1951-52, 3 collections, August 11 to September 2: 4 males.

1953, 6 collections, August 7 to 31: 3 males, 3 females.

Collection sites 1951-52: 5(1), 12(1), 15(1).

Collection sites 1953: 2(1), 5(1), 9(2), 14(1), 15(1).

Seven of the 9 collections were from light traps.

59. Frenesia missa (Milne)*

1953, 9 collections, September 21 to November 17: 34 males, 2 females.

Collection sites 1953: 1(1), 5(7), 10(1).

Seven of the 9 collections were from lighted windows at Site 5.

60. Glyphopsyche irrorata (Fabricius)*

1950, 2 collections, October 31 and November 1: 1 male, 3 females.

1953, 3 collections, May 8 to November 10: 5 males.

Collection site 1950: 5(2).

Collection sites 1953: 5(2), 10(1).

Four of the collections were from lights and 1 method was not recorded.

61. Psychoglypha subborealis (Banks)*

1950, 3 collections, October 18 to November 1: 4 males, 1 female.

1953, 3 collections, February 5 to November 10: 4 males, 1 female.

Collection sites 1950: 1(2), 5(1).

Collection site 1953: 5(3).

The apparent restriction of the distribution to the upper portion of the study area may be due in part to lack of collecting effort in the other areas during the winter months. These specimens were about equally abundant in light-source and air-net collections.

62. Neophylax autumnus Vorhies*

1952, 14 collections, August 25 to October 30: 61 males, 3 females.

1953, 26 collections, July 20 to October 12: 260 males, 66 females.

Collection sites 1952: 2(8), 5(2), 6(4).

Collection sites 1953: 1(3), 2(5), 5(12), 7(3), 10(1), 14(1), 15(1).

All the females were collected after September 8 in 1952 and 1953.

Only 3 of the collections (4 specimens) were made downstream from Site 1. This species was about equally abundant in air-net and light-trap collections.

63. Neophylax oligius Ross*

1951-52, 13 collections, August 4 to September 9: 11 males, 17 females.

1953, 38 collections, July 14 to September 15: 66 males, 76 females.

Collection sites 1951-52: 2(1), 5(7), 6(2), 7(1), 8(1), 15(1).

Collection sites 1953: 1(2), 2(1), 5(10), 7( ), 9(6), 10(5), 14(2), 15(5).

Neophylax oligus was more abundant in samples from the middle and lower parts of the study area (Site 5 to Site 15) and N. autumnus was more abundant in the upper part (Site 5 and above). N. ologius occurred in 30 light-trap collections and in only 8 air-net collections in 1953 while N. autumnus was about equally abundant in the two types of collections.

Family MOLANNIDAE

64. Molanna tryphena Betten*

1953, 1 collection, July 18: 1 male, Site 10, from a light trap.

65. Molanna uniophila Vorhies

1951-52, 2 collections, June 26 and August 11: 2 males, Site 15.

1953, 1 collection, July 31: 1 male, Site .

Two collections were from lights (the third method was not recorded).

66. Molanna sp.

1953, 2 collections, June 1 and 24: 2 females, Sites 5 and 10, with air net.

Family LEPTOCERIDAE

67. Leptocerus americanus (Banks)*

1953, 12 collections, June 30 to July 21: 3 males, 93 females.

Collection sites 1953: (4), 9(3), 10(2), 14(3).

All specimens were from light traps. One collection produced the 3 males and 69 of the females at Site on June 30.

68. Leptocella albida (Walker)*

1951-52, 4 collections, July 11 to September 9: 2 males, 1 female.

1953, 26 collections, June 1 to September 29: 23 males, 75 females.

Collection sites 1951-52: 5(2), 15(2).

Collection sites 1953: 1(1), 5(2), (2), 9(2), 10(5), 14(6), 15(3).

No males and only 4 females occurred in light-trap collections in 1953.

69. Athripsodes alagmus Ross*

1953, 1 collection, July 15: 1 male, Site 10, light trap.

70. Athripsodes cancellatus (Betten)*

1953, 1 collection, July 1: 1 male, Site 10, light trap.

71. Athripsodes nephus Ross*

1953, 1 collection, July 1: 4 males, 2 females, Site 14, light trap.

72. Athripsodes resurgens (Walker)*

1953, 1 collection, June 1: 1 male, Site 15, air net.

73. Athripsodes tarsi-punctatus (Vorhies)*

1953, 1 collection, July 29: 1 male, Site 15, air net.

74. Athripsodes transversus (Hagen)*

1953, 1 collection, July 1: 1 male, Site 10, light trap.

75. Oecetis avara (Banks)*

1952, 2 collections, June 20 and June 25: 14 males, 1 female.

1953, 29 collections, June 11 to August 1: 88 males, 17 females.

Collection sites 1952: 1(1), 5(1).

Collection sites 1953: 1(9), 5(13), 7(3), 10(1), 14(2), 15(1).

This species was more abundant in collections from the upper half of the study area and was about equally abundant in air-net and light-trap collections.

76. Oecetis cinerascens (Hagen)*

1951-52, 3 collections, June 20 to August 5: 1 male, 2 females.

1953, 4 collections, June 29 to August 1: 4 females.

Collection sites 1951-52: 1(1), 3(1), 15(1).

Collection sites 1953: 1(1), 5(1), 7(1), 10(1).

This species was equally abundant in air-net and light-trap collections.

77. Oecetis inconspicua (Walker)*

1951-52, 3 collections, August 11 to September 9: 1 male, 3 females.

1953, 13 collections, June 8 to August 31: 6 males, 14 females.

Collection sites 1951-52: 5(1), 15(2).

Collection sites 1953: 2(1), 5(5), 9(4), 10(1), 14(2).

All collections were from light traps or lanterns.

78. Triaenodes injusta (Hagen)*

1952, 1 collection, June 13: 1 male, Site 10, lantern.

79. Triaenodes marginata Sibley*

1951, 2 collections, August 11: 10 females.

1953, 4 collections, July 18 to August 7: 5 females.

Collection site 1951: 15(2).

Collections sites 1953: 9(1), 10(1), 14(2).

Five of the 6 collections were from light traps and all were from the lower half of the study area.

80. Triaenodes tarda Milne*

1951, 1 collection, August 11: 2 males, 3 females.

1953, 8 collections, June 17 to August 11: 1 male, 10 females.

Collection site 1951: 15(1).

Collection sites 1953: 7(2), 9(2), 10(1), 14(3).

All collections were from lantern or light traps.

81. Triaenodes sp.

1953, 4 collections, June 25 to August 15: 4 females.

Collection sites 1953: 5(1), 7(1), 9(1), 15(1).

Three collections were from light traps and 1 was made with an air net.

82. Mystacides longicornis (Linnaeus)*

1951, 1 collection, August 11: 1 female, Site 15, lantern.

83. Mystacides sepulchralis (Walker)*

1953, 4 collections, June 17 to August 5: 6 males, 1 female.

Collection sites 1953: 9(1), 10(1), 15(2).

All collections were made with air net.

84. Setodes incerta (Walker)*

1953, 1 collection July 15: 1 female, Site 10, light trap.

Family GOERIDAE

85. Goera stylata Ross*

1952, 1 collection, June 19: 1 female.

1953, 13 collections, May 27 to June 21: 26 males, 62 females.

Collection site 1952: 2(1).

Collection sites 1953: 2(5), 5(6), 14(1), 15(1).

Twelve of the 14 collections were from light traps, and only 2 collections were from below Site 5.

Family LEPIDOSTOMATIDAE

86. Lepidostoma bryanti (Banks)

1951-52, 14 collections, June 15 to August 19: 7 males, 14 females.

1953, 33 collections, May 20 to June 29: 41 males, 65 females.

Collection sites 1951-52: 1(4), 2(2), 5(1), 6(1), 8(1), 9(1), 11(2), 14(1), 15(1).

Collection sites 1953: 1(4), 2(6), 5(11), 7(1), 9(3), 10(4), 14(2), 15(2).

This species was collected more often with air net than with light traps.

87. Lepidostoma costalis (Banks)*

1951-52, 4 collections, August 11 to September 9: 1 male, 3 females.

1953, 21 collections, July 29 to August 24: 67 males, 53 females.

Collection sites 1951-52: 2(2), 5(1), 15(1).

Collection sites 1953: 1(5), 2(5), 5(3), 9(1), 10(3), 15(1).

This species was about equally common in air-net and light-trap collections.

88. Lepidostoma griseum (Banks)*

1951-52, 2 collections, August 5 and September 2: 2 males.

1953, 7 collections, August 10 to August 24: 10 males, 3 females.

Collection sites 1951-52: 1(1), 5(1).

Collection sites 1953: 1(1), 2(3), 5(1), 7(1), 15(1).

This species occurred more often in light-trap than in air-net collections.

39. Lepidostoma sackeni (Banks)*

1952, 1 collection, August 25 and 26: 1 male, Site 5, light trap.

90. Lepidostoma strophis Ross*

1952, 10 collections, August 25 to September 10: 13 males, 11 females.

1953, 14 collections, August 13 to September 28: 15 males, 11 females.

Collection sites 1952: 2(5), 5(2), 6(3).

Collection sites 1953: 1(1), 2(2), 5(3), 6(3), 9(2), 10(2), 15(1).

This species occurred more often in air-net than in light-trap collections.

91. Lepidostoma togatum (Hagen)*

1952, 1 collection, September 9: 1 female.

1953, 3 collections, July 14 to 17: 4 males, 5 females.

Collection site 1952: 10(1).

Collection sites 1953: 7(2), 9(1).

Three collections were from light-trap and 1 from air-net collections.

92. Lepidostoma sp.

1952, 1 collection, September 9: 1 female.

1953, 2 collections, July 20 to July 30: 1 male, 5 females.

Collection site 1952: 10(1).

Collection sites 1953: 2(1), 7(1), 9(1).

All collections were from light traps.

Family BRACHYCENTRIDAE

93. Micrasema rusticum (Hagen)*

1951-52, 13 collections, June 15 to August 4: 20 males, 12 females.

1953, 71 collections, June 11 to August 21: 345 males, 184 females.

Collection sites 1951-52: 1(5), 5(2), 11(1), 12(1), 13(2), 14(1), 15(1).

Collection sites 1953: 1(12), 2(5), 5(13), 7(11), 9(10), 10(9), 14(4), 15(7).

This species was about equally abundant in light-trap and air-net collections.

94. Brachycentrus americanus (Banks)*

1951-52, 56 collections, June 16 to September 10: 83 males, 63 females.

1953, 154 collections, June 3 to September 21: 764 males, 238 females.

Collection sites 1951-52: 1(7), 2(16), 3(1), 4(1), 5(10), 6(6), 7(1), 8(1), 9(1), 10(5), 11(1), 12(2), 13(3), 14(1).

Collection sites 1953: 1(16), 2(19), 5(43), 7(14), 9(21), 10(23), 14(8), 15(10).

This species was about as common in light-trap as in air-net collections.

95. Brachycentrus numerosus (Say)*

1953, 3 collections, May 12 to June 11: 21 males, 6 females.

Collection site 1953: 15(3).

No larval B. numerosus were found in collections from Houghton Creek. The adults in these collections were all taken with air net but may have flown into the area from the Rifle River.

Family HELICOPSYCHIDAE

96. Helicopsyche borealis (Hagen)*

1951-52, 2 collections, June 26 and August 11: 1 male, 1 female.

1953, 10 collections, June 19 to August 5: 7 males, 7 females.

Collection sites 1951-52: 15(2).

Collection sites 1953: 5(2), 9(2), 14(6).

All collections were from light traps or lanterns. Larvae of this species were not found in collections of bottom fauna from Houghton Creek but adults were taken from near both ends of the study area.

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