

ADDITIONAL NOTES ON THE ODONATA (DRAGONFLIES) OF OHIO

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Since 1941 I have collected dragonflies at odd moments. This paper lists the distribution and other observations recorded for the Odonata of Ohio. The majority of my records are from Ashland County; other records of interest are also presented at this time.

Certain collecting sites in Ashland County may be mentioned because of the dragonfly fauna found in the area. The Savannah Lakes in Clear Creek Township are glacial potholes. *Enallagma ebrium* and *Gomphus spicatus* are distinctive of these. A series of similar potholes lies in Lake Township, and one of these, Round Lake, has been visited repeatedly. The dragonflies collected at Round Lake include *Celithemis monomelaena*, *Aeschna mutata*, *Libellula incesta*, *Lestes inaequalis*, *L. vigilax*, and *Enallagma traviatum*. Perhaps the most varied dragonfly fauna of Ashland County is found along the Mohican River from the Pleasant Hill Dam in Hanover Township to the Holmes County line. This fauna is particularly rich in gomphines, but includes other types. Two flood-control reservoirs of the Muskingum Conservancy District, namely, the Pleasant Hill Reservoir and the Charles Mill Reservoir touch Ashland County, but neither has produced a rich or distinctive dragonfly fauna. In addition dragonflies were collected at numerous places in streams, ponds, and swamps.

I have taken 80 species in Ashland County, but I have not recaptured 3 species recorded by Borror (1937). These are *Hagenius brevistylus* from the Ohio State University Collection, *Gomphus abbreviatus* taken by Hine in 1900 and 1913, and *Agrion angustipenne* also from the Ohio State University Collection. The total species recorded for Ashland County are now 83.

Other collecting sites of possible interest have been visited. Sites Lake in Mifflin Township of Richland County is a glacial pothole and produces *Gomphus spicatus*, *Lestes inaequalis*, and *Enallagma traviatum* as well as other species encountered in various habitats. The Leesville Reservoir in Carroll County and the Tappan Reservoir in Harrison County were each visited once, as well as the creek and millpond at Phalanx Mills, Trumbull County. Brown's Lake Bog in Wayne County produces many of the dainty damsel fly, *Nehalennia gracilis*.

LIST OF SPECIES

The species in the following list are numbered according to Borror's (1937) list. The records are given by counties, and other observations deemed worthy of reporting are included.

4. *Ophiogomphus rupinsulensis* (Walsh). Coshocton, Knox.
9. *Gomphus exilis* Selys. Carroll. This record is based on one specimen taken by Mr. Jon Shidler and presented to me.
10. *Gomphus fraternus* (Say). Richland.
12. *Gomphus graslinellus* Walsh. Ashland, Richland.
13. *Gomphus lineatifrons* Calvert. I have taken 2 females of this large rare gomphine; a specimen taken June 23, 1943, extends the extreme date of late occurrence in Ohio.
18. *Gomphus spicatus* Hagen. Richland.
19. *Gomphus spiniceps* (Walsh). Ashland.
22. *Gomphus villosipes* Selys. Ashland. Collected as late as July 5, 1945.
23. *Gomphus viridifrons* Hine occurs along the Mohican River as late as June 23 (1943).
24. *Dromogomphus spinosus* Selys. Ashland.

26. *Lanthus albistylus* Hagen. On June 7, 1959, Mrs. Harwood observed the transformation of this species on a stone at the edge of the Mohican River near Ball Run. I captured specimens on July 28, 1959. These records extend the season of flight of this species in Ohio.
28. *Basiaeschna janata* (Say). Ashland.
30. *Boyeria vinosa* (Say). Ashland, Holmes.
31. *Anax junius* (Drury). Trumbull.
34. *Epiaeschna heros* (Fabricius). Ashland.
36. *Aeschna constricta* Say. Ashland, Richland. Taken as early as July 16, 1945.
37. *Aeschna mutata* Hagen. Ashland.
38. *Aeschna umbrosa* Walker. Ashland, Ashtabula, Richland. The latest date of capture is November 1, 1947, when this species was observed feeding on flying aphids.
39. *Aeschna verticalis* Hagen. Ashland.
40. *Cordulegaster diastatops* (Selys). Ashland.
43. *Cordulegaster obliquus* (Say). Ashland.
44. *Macromia illinoiensis* Walsh. Ashland.
49. *Epicordulia princeps* Hagen. Carroll, Richland.
50. *Tetragoneuria cynosura* (Say). Carroll, Huron.
133. *Somatochlora linearis* (Hagen). Ashland, Lorain. July 25, 1954, to September 3, 1950. On July 25, 1954, I observed a female ovipositing in the shade on moist gravel in Findlay State Park. She was wary and difficult to approach closely. When disturbed she flew into the sunshine, but returned to the side of the same shady pool in a few minutes. By moving very slowly, I was able to capture her.
52. *Somatochlora tenebrosa* Say. Ashland.
54. *Perithemis tenera* (Say). Carroll, Harrison, Trumbull.
56. *Celithemis eponina* Drury. Harrison.
57. *Celithemis monomelaena* Williamson. General specimens of this insect were observed at Round Lake, Ashland County on June 11, 1950.
63. *Libellula incesta* Hagen. Ashland, Holmes, Wayne. This species has never been seen at the Savannah Lakes, but it is abundant at Round Lake and Long Lake in southern Ashland County. It has been taken from June 24, 1950, to August 15, 1959.
66. *Libellula pulchella* Drury. Carroll.
67. *Libellula quadrimaculata* Linnaeus. Ashland.
68. *Libellula semifusciata* Burmeister. Ashland.
69. *Libellula vibrans* Fabricius. Ashland. This species was found about woodland pools in extreme northern Ashland County from June 14 to July 4, 1959. The area is rich in limestone. Since *L. vibrans* has not been found about numerous woodland pools that have been visited in the acid-soil areas of Ashland County, it seems possible that *L. vibrans* prefers calcareous soils.
65. *Plathemis lydia* Drury. Stark, Trumbull.
72. *Sympetrum obtrusum* (Hagen). Ashland.
74. *Sympetrum semicinctum* (Say). Ashland.
76. *Sympetrum vicinum* (Hagen). Ashland, Clark.
77. *Leucorrhinia intacta* Hagen. Ashland.
78. *Pachydiplax longipennis* (Burmeister). Clinton.
79. *Erythemis simplicicollis* (Say). Carroll, Trumbull. In 1947, this species was taken as early as May 4.
80. *Pantala flavescens* (Fabricius). Ashland.
81. *Pantala hymenaea* (Say). Ashland. This species and its congener appeared in numbers in Ashland County from August 12 to September 2, 1956. I have not seen either species in other years.
87. *Agrion maculatum* Beauvois. Carroll.
91. *Lestes congener* Hagen. Ashland, Holmes. The flight season of this species extends from June 26, 1959 to October 28, 1959 according to my collection records.

On September 13, 1959, I found several pairs of this species ovipositing on the borders

of a woodland pond in Montgomery Township of Ashland County. Color photographs were taken and the act of oviposition observed under a 14X hand lens. Samples of leaves containing eggs were brought to the laboratory and dissected under a stereoscopic microscope. Since these several observations are sometimes at variance with recorded observations, they may possibly be worth reporting.

The pond was surrounded by trees. Consequently, the margins were sparsely lined with herbaceous plants, such as *Bidens*, *Iris*, *Leersia* and *Glyceria*. The *Lestes congener* were perched on all the plants, but the limitation of tandem pairs to clumps of *Glyceria* sp. first attracted attention. When disturbed these pairs alighted on all nearby objects, including the trunks of trees. Females were observed probing all surfaces with their ovipositors, but were observed to complete the act only in dead leaves and sheaths of *Glyceria*. When driven from the clumps of this grass, the tandem pairs returned to the same clump or another of the same species in a few minutes. Although they lighted on living plants of *Glyceria*, oviposition was limited as indicated. This is contrary to Walker (1953) who reported *L. congener* ovipositing both in green and in dead vegetation.

The position while ovipositing is exactly as figured by Walker (1953). The female's head, thorax, and first three abdominal segments are nearly at right angles to the supporting surface. A sharp bend brings the fourth segment nearly parallel to the surface. The remaining segments descend directly to the leaf.

The act of ovipositing as observed under a hand lens was described as follows in my notebook. "The female arches her abdomen as Walker describes, the terebra is unsheathed and thrust into the dead grass leaf by a series of muscular contractions involving the entire abdomen. I did not count the muscular jerks but estimate that 100 require less than a minute. The terebra is thrust into the leaf until the valves of the sheath are flat against the surface. The abdomen is at this time bent sharply between segments 7 and 8."

The eggs were laid from 3 to 18 in. above the surface of the earth. Water, which was fully covered by duckweed, was about 6 ft from the base of the plants used for oviposition. I ascertained by dissection of marked sites that the terebra may be inserted and withdrawn without oviposition taking place.

The eggs were dark brown, about 2 mm long and about $\frac{1}{8}$ as wide. They were nearly cylindrical, rounded at one end and pointed at the other. They were laid in a single row; not in two parallel rows as figured and described for several European species of *Lestes* by Schiemenz (1957). The distance between eggs in a row varied from 2 to 5 mm. The long diameter of the egg was often in line with the row, or it lay at an angle of as much as 30°. The diameter of the eggs was greater than the space between upper and lower epidermis. Therefore, the leaf surface bulged slightly over each egg.

92. *Lestes disjunctus australis* Walker. Ashland.
94. *Lestes forcipatus* Rambur. Ashland, Huron, Richland.
95. *Lestes inaequalis* Walsh. Richland, Wayne. My earliest collection date, June 11, 1949, from Round Lake advances the flight season for Ohio slightly.
96. *Lestes rectangularis* Say. Price (1958) writes that specimens taken late in the season at Dehn's Swamp in Williams County were the smallest he has seen. I took specimens of average size at the Goose Pond in Ashland and Wayne Counties on October 28, 1950, which is the latest seasonal date recorded for Ohio.
97. *Lestes dryas* Kirby. Huron. Taken as late as August 16, 1959, in Ashland County.
98. *Lestes unguiculatus* Hagen. Ashland.
99. *Lestes vigilax* Hagen. Ashland. I collected this species only once, August 24, 1947, at Round Lake. This extends the flight-season for Ohio by 3 weeks.
100. *Argia apicalis* (Say). Ashland, Holmes, Richland, Trumbull.
102. *Argia moesta* (Hagen). Lorain, Richland. In 1949, this species was especially abundant along the Mohican River in Ashland County. On September 10, 1949, females, attended in every case by males, were observed ovipositing in leaves of the sycamore (*Platanus occidentalis* L.). The river was low and the large yellow leaves that were dropping in some numbers lodged frequently against stones that barely protruded above the surface of the water. These leaves were favored sites for oviposition and as many as 16 pairs were

- observed perched on a single leaf. The sycamore leaves were the most favored sites for oviposition, but not the only site employed.
103. *Argia sedula* (Hagen). Ashland. Taken as late in the season as September 22, 1947, in Ashland County.
 104. *Argia tibialis* (Rambur). Huron.
 105. *Argia violacea* (Hagen). Belmont, Carroll, Guernsey.
 106. *Amphiagrion saucium* (Burmeister). Ashland, Morrow, Richland.
 107. *Nehalennia gracilis* Morse. Wayne.
 109. *Chromagrion conditum* (Hagen). Morrow.
 110. *Enallagma antennatum* (Say). Ashland, Lorain, Richland.
 111. *Enallagma aspersum* (Hagen). Ashland, Belmont, Crawford, Madison, Morrow, Richland. A collection record of September 10, 1950, extends the flight season of *E. aspersum* by a month.
 129. *Enallagma basidens* Calvert. Ashland.
 113. *Enallagma carunculatum* Morse. Harrison.
 114. *Enallagma civile* (Hagen). Ashland, Trumbull.
 115. *Enallagma divagans* Selys. Ashland, Richland.
 117. *Enallagma ebrium* (Hagen). Ashland.
 118. *Enallagma exsulans* (Hagen). Ashland.
 119. *Enallagma geminatum* Kellicott. Carroll, Richland, Trumbull, Wayne.
 120. *Enallagma hagani* Walsh was taken as late as July 15, 1948.
 121. *Enallagma signatum* (Hagen). Trumbull.
 122. *Enallagma traviatum* (Selys). Ashland, Carroll, Richland, Wayne.
 123. *Enallagma vesperum* Calvert. Richland. Taken as late in the season as September 18, 1941.
 124. *Ischnura posita* (Hagen). Richland.
 127. *Anomalagrion hastatum* (Say). Ashland, Wayne. Taken on October 28, 1950, at the Goose Pond in Wayne County. This record extends the known flight season for Ohio by more than a month.

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