

RECORDS OF INDIANA DRAGONFLIES—IV. 1929

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About 850 specimens of dragonflies, representing 72 species, were collected in Indiana during the season of 1929; most of these were collected by E. B. Williamson and others who accompanied him on collecting trips, including Eli Captain, Norman Shufelt, Lloyd A. Cowens, W. H. Ditzler, Z. E. Malcolm, H. T. Speith, A. D. Holloway, Paul Cook, C. H. Kennedy, and James G. Needham; John Warrick Emerson and V. R. Diamond each accompanied the writer on several collecting trips and made many captures.

New county records, notes on rare species, and such notes on habits and associations as seem new are recorded in this paper. A few earlier records omitted for various causes from previous papers in this series (Williamson, 1917, 1920; Montgomery, 1925, 1927, 1929) are included; such records have the year included—all records without indication of the year are from the 1929 season. Field notes are placed within quotation marks and are followed by initials "E. B. W." or "B. E. M.", indicating whether Mr. Williamson or the writer made the observations.

Two species not previously reported from the state are recorded, bringing the Indiana list of dragonflies to 131 species.

John Warrick Emerson and the writer visited the water supply reservoir at Oakland City, which was described last year (Montgomery, 1929) on July 28 and found the same species as were noted last year and in addition *Libellula pulchella*. On the same day a small pond in a meadow pasture along Indiana State Road 56 near the Pike-Dubois county line and a pond (Limeberry pond) covering about two acres, in Orange County, one-half mile south of the Paoli-Salem road, four and one-half miles from Paoli, were visited. The latter pond was surrounded for the most part with waste land covered with sparse vegetation, but merged into a woodland swamp at one end. The day was very warm—high temperature record for season—and Odonate life was very active; the usual Indiana pond association of Libellulines was noted but no Zygoptera were seen.

"Lotus Pond," Knox County, was visited on several different days but conditions were much changed from those in previous years (Montgomery, 1929). The water was very low, covering only the narrow open strip in the center of the pond; much of the area grown up with water smartweed and other plants was entirely dry. *Pachydiplax longipennis* and *Erythemis simplicicollis* were numerous but much reduced in numbers from last year. *Ischnura posita* was rare, *I. verticalis* common but not numerous, *Anomalagrion hastatum* was more common than at any time in past seasons; one male of *Nehalennia irene* and a male and a female of *Sympetrum vicinum* were taken. Hundreds of *Lestes rectangularis* were seen.

Extensive collecting was done in the Eel River basin in Cass County especially along Twelve Mile and Mud Creeks, parallel streams on the right bank of Eel River, west of Hoover. These creeks are fed by cold springs and there are marshes and swamps along their courses; their banks are partly wooded.

The numbers of Williamson's Indiana list (1917) are followed in this paper.

1. *Agrion aequabile* Say. Cass Co., Mud Creek, June 23, a male was seen but not taken.

3. *Agrion maculatum* Beauvois. **Harrison Co.**, Indian Creek, Corydon, Aug. 31; **Jackson Co.**, Muscatatuck River, Sept. 1; **Wayne Co.**, Shaded Creek near Tuberculosis Sanitarium, July 28.

4. *Hetaerina americana* Fabricius. **Cass Co.**, Wabash River, west of Logansport, Sept. 15, Eel River near Hoover and Twelve Mile Creek, Sept. 22; **Harrison Co.**, Indian Creek, Corydon, Aug. 31.

5. *Hetaerina titia* Drury. **Harrison Co.**, Indian Creek, Corydon, Aug. 31; **Jackson Co.**, Muscatatuck River, Sept. 1. Collecting was done along the latter stream between a point one-half mile above the bridge on Indiana State Road 31 to a point about 150 yards below the nearby railroad bridge; *H. titia* was noted along this entire distance but *H. americana* was not seen.

9. *Lestes forcipatus* Rambur. **Huntington Co.**, pond at New Lancaster, Aug. 11; **Pike Co.**, pond in pasture, July 28.

11. *Lestes rectangularis* Say. **Cass Co.**, marsh along Twelve Mile Creek, July 14; **Huntington Co.**, upland pond near Salamonie River, June 9, ponds at Mt. Etna and New Lancaster, Aug. 11; **Pike Co.**, pond July 28, **Vigo Co.**, pond, three miles south of Pimento, July 4; **Wayne Co.**, July 28; **Wells Co.**, Vanemon Swamp, Sept. 14; a new late season record for this species in Indiana.

12. *Lestes uncalus* Kirby. **Cass Co.**, marsh along Twelve Mile Creek July 14.

13. *Lestes unguiculatus* Hagen. **Cass Co.**, Mud Creek, June 23 and Sept. 15, marsh along Twelve Mile Creek, July 14; **Huntington Co.**, ponds at Mt. Etna and New Lancaster, Aug. 11.

15. *Argia apicalis* Say. **Jackson Co.**, Muscatatuck River, Sept. 1; **White Co.**, Tippecanoe River below Schafer Lake, Sept. 8.

16. *Argia moesta* Hagen. **Cass Co.**, Wabash River, two to four miles west of Logansport, Sept. 15; **White Co.**, Tippecanoe River below Schafer Lake, Sept. 8.

17. *Argia sedula* Hagen. **White Co.**, Tippecanoe River below Schafer Lake, Sept. 8; one male was taken; associated with *A. moesta* which was common.

18. *Argia tibialis* Rambur. **Jackson Co.**, Muscatatuck River, Sept. 1. "About the only *Argia* here; *apicalis* rare and no other seen." (E. B. W.)

20. *Argia violacea* Hagen. **Pike Co.**, pond July 28; **Vigo Co.**, pond, Pimento, July 4.

21. *Enallagma antennatum* Say. **Pike Co.**, pond, July 28; **Vanderburg Co.**, pond, Mesker Park, Evansville, May 23, 1928.

25. *Enallagma civile* Hagen. **White Co.**, Tippecanoe River below Schafer Lake, Sept. 8.

28. *Enallagma ebrium* Hagen. **Huntington Co.**, pond at New Lancaster, July 21, "Only one was seen; it was doubtless a stray." (E. B. W.)

29. *Enallagma exsulans* Hagen. **Cass Co.**, Wabash River, Sept. 15; **White Co.**, Tippecanoe River below Schafer Lake, Sept. 8.

34. *Enallagma signatum* Hagen. **Huntington Co.**, pond at New Lancaster, Aug. 11; **Vanderburg Co.**, pond, Mesker Park, Evansville, May 23, 1928.

37. *Nehalennia irene* Hagen. **Cass Co.**, marsh near Twelve Mile Creek, July 14.

38. *Amphiagrion saucium* Burmeister. **Cass Co.**, Mud Creek, June 23.

39. *Chromagrion conditum* Hagen. **Cass Co.**, Mud Creek, June 23.

41. *Ischnura posita* Hagen. **Cass Co.**, Mud Creek, June 23, associated with the two preceding species at a pool; **Jackson Co.**, Muscatatuck River,

Sept. 1; **Pike Co.**, pond, July 28; **White Co.**, Tippecanoe River below Schafer Lake, Sept. 8.

43. *Ischnura verticalis* Say. **Cass Co.**, Wabash River and Mud Creek, Sept. 15; **Jackson Co.**, Muscatatuck River, Sept. 1; **Pike Co.**, pond July 28; **Wayne Co.**, pond near Tuberculosis Sanitarium, July 28; **White Co.**, Tippecanoe River, below Schafer Lake, Sept. 8.

44. *Anomalagrion hastatum* Say. **Pike Co.**, pond, July 28.

45. *Tachopteryx thoreyi* Hagen. This rare species was taken at two localities, a female along Mud Creek, **Cass Co.**, June 23, and a total of eleven specimens, nine males and two females, at a bog along a creek below Monument City, **Huntington Co.**, June 9, 11, 30, July 10. "Rested on trees in every case," June 9. "Only one seen—flew in and alighted five feet high on large tree near creek in pasture," June 23. "Arrived at bog about noon and in 15 minutes E. B. W. caught three males and Eli Captain had two others in net but they escaped. Two or three more were seen in next 30 minutes when it grew very cloudy and no more seen. Saw no *Cordulegaster* to-day. Saw *Tachopteryx* capture moth; it flew adeptly, swiftly and relentlessly through low sedge growth and picked the moth up on the wing. Later another shot out over creek and seized a *Calopteryx* with all the rush and precision of an *Accipiter*; it then flew up 30 feet, alighting on trunk of a basswood—so far as I could tell it ate wings and all. (I believe Hagenius clips off *Calopteryx* wings)," June 30. "On tree as usual, and, as usual had to touch abdomen with net to cause it to raise abdomen above the bark. Saw only one other—a female—flew and alighted on my shoulder; as Eli approached with the net it flew away through the woods. I thought its abdomen was wet and a little muddy; I think it had been ovipositing. The season is over for *Tachopteryx*." July 10, (E. B. W.).

46. *Cordulegaster diastatops* Selys. **Cass Co.**, bog along Mud Creek, June 13 and 23; **Huntington Co.**, bog along creek near Monument City, June 9 and 11. This species, also rare in the state, was associated with the preceding species at the Huntington County bog, where a male was taken on each date noted; at Mud Creek this was more numerous than *T. thoreyi*—fourteen males were captured on June 23.

49. *Progomphus obscurus* Rambur. **Cass Co.**, Twelve Mile Creek, July 14.

50. *Hagenius brevistylus* Selys. **Cass Co.**, Eel River near Hoover, July 22, Aug. 11, Twelve Mile Creek, June 23, July 14 and 22, Mud Creek, June 23, "On Mud Creek saw a male (*H. brevistylus*) catch *Calopteryx maculata* male. Saw many floating wings of *C. maculata*. on Twelve Mile Creek." (See note under No. 45, *Tachopteryx thoreyi*, above) June 23, (E. B. W.).

51. *Ophiogomphus rupinsulensis* Walsh. **Cass Co.**, June 13; **Huntington Co.**, clearing in wood near Salamonie River, June 9.

53. *Gomphus crassus* Hagen. **Huntington Co.**, ripple in Salamonie River and clearing in wood near same stream, June 9.

54. *Gomphus lineatifrons* Calvert. (Listed as *G. dilatatus* Rambur in Indiana List, 1917; See Calvert, 1921). **Cass Co.**, near Mud Creek, June 13, Twelve Mile Creek, June 23, "On Twelve Mile today *G. lividus* was fairly common, *grastinellus* rare, *lineatifrons* very rare (one seen), *H. brevistylus* fairly common but wary," June 23, (E. B. W.).

55a. *Gomphus externus* Hagen. **Gibson Co.**, Wabash River, July 27, 1927. This is the first Indiana record of this species which, however, has long been known to be regional for the state.

56. *Gomphus fraternus* Say. **Cass Co.**, Eel River, July 22.
58. *Gomphus grasinellus* Walsh. **Cass Co.**, Twelve Mile Creek, June 23, July 14, Eel River, July 22. "Two pairs seen in copulation—one on large flat rock in stream, other on ground near edge of water," July 14. "Only one taken—shot from thirty feet high in cottonwood. Frequently Gomphi were seen to fly over river and back to tree tops as this one did just before it was shot. Whether other individuals of this habit were same species was not determined," July 22, (E. B. W.).
59. *Gomphus lividus* Selys. **Cass Co.**, Twelve Mile Creek, June 23, Mud Creek, July 14.
- 59a. *Gomphus notatus* Rambur. **Clark Co.**, near Ohio River, Sept. 11, hanging on tree near pasture over which *Pantala flavescens* and *P. hymenaea* were flying in swarm; **Jackson Co.**, Muscatatuck River, Sept. 1, flying over ripple where *Dromogomphus spoliatus* and *Macromia taeniolata* were present; **Knox Co.**, orchard, near Wheatland, July 30, 1928.
60. *Gomphus quadricolor* Walsh. **Cass Co.**, near Mud Creek, June 13.
64. *Gomphus vastus* Walsh. **Cass Co.**, Eel River near Hoover, July 22.
65. *Gomphus ventricosus* Walsh. **Cass Co.**, near Mud Creek, June 13.
68. *Dromogomphus spinosus* Selys. **Cass Co.**, Eel River, July 22, Aug. 11, Mud Creek, June 23, Twelve Mile Creek, July 14, "Two or three were seen on stones and sand along creek. This one was taken on low broad leaf in marsh," July 14, (E. B. W.).
69. *Dromogomphus spoliatus*, Hagen. **Jackson Co.**, Muscatatuck River, Sept. 1.
70. *Boyeria vinosa* Say. **Cass Co.**, Mud Creek and Twelve Mile Creek, Sept. 22; **Harrison Co.**, Indian Creek, Corydon, Aug. 31; **Monroe Co.**, Salt Creek, Bloomington, Sept. 21. "Female was ovipositing in three inch log which was partly submerged. She was resting just above water line with abdomen extending into water and slightly curved around log toward under side so that eggs were being deposited in the log at a point well beneath the surface of the water;" Sept. 22, (B. E. M.). "After Shufelt struck at it with his net it flew in behind him and began laying eggs in his wet pants a few inches above the water," Aug. 31, (E. B. W.).
72. *Anax junius* Drury. **Cass Co.**, Mud Creek, Sept. 15, Twelve Mile Creek, Sept. 22; **Huntington Co.**, pond at New Lancaster. July 21 and Aug. 11, upland pond near Salamonie River, June 9.
75. *Aeshna constricta* Say. **Cass Co.**, marsh near Twelve Mile Creek, July 14.
78. *Aeshna umbrosa* Walker. **Cass Co.**, Wabash River, about five miles west of Logansport, and Mud Creek, Sept. 15, Twelve Mile Creek and Mud Creek, Sept. 22; **Wayne Co.**, shaded creek near Tuberculosis Sanitarium, July 28. Special attention was given to *Aeshna* collecting this year, but without very much success. Nine males of *A. constricta* (eight of them at Vanemon Swamp, **Wells Co.**), 12 males and three females of *A. umbrosa*, and one female of *A. verticalis* made up the entire catch. A large number of *Aeshnines* were present along Mud Creek, Sept. 15. After members of the collecting party had walked through a marsh area on a hillside near the creek the air seemed filled with a swarm of dragonflies which had been flushed. Of those collected 18 were *Anax junius*, three *Aeshna umbrosa* and one *A. verticalis*. One week later Mr. V. R. Diamond and the writer returned to this locality but saw no dragonflies; although

A. umbrosa was taken at a bog some distance up the creek and both *Anax junius* and *A. umbrosa* were taken at a marsh near Twelve Mile Creek. "Old Robinson Park Site, northeast of Fort Wayne, Allen County, Sept. 22. Examined old pond where one day years ago I got more than 40 Aeshnas; none there to-day. Only few *umbrosas* seen all day—no other Aeshnas." (E. B. W.).

79. *Aeshna verticalis* Hagen. See note under preceding species.

83. *Macromia illinoiensis* Walsh. **Cass Co.**, Eel River, near Hoover, July 22; **Harrison Co.**, Blue River, near Corydon, Aug. 31; **Lagrange Co.**, Pigeon River, near Howe, Aug. 7.

84. *Macromia pacifica* Hagen. **Cass Co.**, Eel River, near Hoover, Aug. 11.

85. *Macromia taeniolata* Rambur. **Jackson Co.**, Muscatatuck River, Sept. 1.

94. *Somatochlora linearis* Hagen. **Allen Co.**, creek in old Indian Reservation, southwest of Fort Wayne, July 18; one female, ovipositing in sand bar several inches above and several feet distance from water.

95. *Somatochlora tenebrosa* Say. **Huntington Co.**, bog near Monument City, July 10 and 21, a male and a female on the earlier date, a male on the latter. "Day bright, clear and windless, following rainy windy weather. Possibly half a dozen seen over bog, none at all on creek or along roads and paths; all erratic, often 30-40 feet high. Evidently the beginning of the season—both these very fresh. Male was beating an opening 30 feet in diameter, and flew 10-15 feet high, dropped down and hung like a *Macromia* on dead twig of willow, eight feet high. Female flew into bog and over it about 30 inches high, dropping down among brush in grass and sedges to oviposit in the cup-fulls of water exposed in tussocks of vegetation. Hovered just above water and thrust abdomen down at intervals, as near as I could see. It was in such spots that we had collected the three *Somatochlora* larvae on June 30," July 10. (E. B. W.)

99. *Libellula luctuosa* Burmeister. **Orange Co.**, Limeberry pond, July 28; **Wayne Co.**, pond near Tuberculosis Sanitarium, July 28.

100. *Libellula pulchella* Drury. **Cass Co.**, Eel River near Hoover, July 22, bog along Mud Creek, June 23; **Orange Co.**, Limeberry pond, July 28.

102. *Libellula semifasciata* Burmeister. **Cass Co.**, bog along Mud Creek, June 23.

103. *Libellula vibrans* Fabricius. **Huntington Co.**, pond at New Lancaster, July 21.

104. *Plathemis lydia* Drury. **Cass Co.**, Twelve Mile Creek, Sept. 22; **Orange Co.**, Limeberry pond, July 28; **Pike Co.**, pond in pasture, July 28.

105. *Perithemis tenera* Say. **Harrison Co.**, ferry over Ohio River south of Corydon, Aug. 31—a female flew across river, falling into water near Kentucky shore and was picked up; **Pike Co.**, pond, July 28.

106a. *Erythrodiplax minuscula* Rambur. **Vigo Co.**, pond three miles south of Pimento, July 15, 1928, one female. This appears to be the first definite record in the Ohio valley of this species which has been carried on various central states lists from Hagen's statement (1861), "Hab. Kentucky."

107. *Erythemis simplicicollis* Say. **Clark Co.**, Ohio River at Jeffersonville, Sept. 11; **Orange Co.**, Limeberry pond, July 28; **Pike Co.**, pond, July 28.

111. *Sympetrum obtusum* Hagen. **Cass Co.**, Mud Creek Sept. 15, Twelve Mile Creek, Sept. 22.

112. *Sympetrum rubicundulum* Say. **Cass Co.**, Mud Creek, Sept. 15, Twelve Mile Creek, July 14 and Sept. 22; **White Co.**, Tippecanoe River below Schafer Lake, Sept. 8.

114. *Sympetrum vicinum* Hagen. **Cass Co.**, Mud Creek, Sept. 22; **Harrison Co.**, near Blue River at Corydon, Aug. 31; **White Co.**, Tippecanoe River below Schafer Lake Sept. 8; **Wells Co.**, alive in gutter, Bluffton, Nov. 13, 1914—this late capture not previously recorded extends the season for the species in Indiana almost a month.

115. *Pachydiplax longipennis* Burmeister. **Pike Co.**, pond, July 28; **Vigo Co.**, pond at Pimento; **Wayne Co.**, pond near Tuberculosis Sanitarium, July 28.

117. *Leucorhinia intacta* Hagen. **Huntington Co.**, upland pond near Salamonie River, June 9.

118. *Celithemis elisa* Hagen. **Huntington Co.**, pond at New Lancaster, Aug. 11; **Orange Co.**, Limeberry pond, July, 28.

121. *Pantala flavescens*, Fabricius. **Clark Co.**, along Ohio River at Jeffersonville, Sept. 11; **Huntington Co.**, pond at New Lancaster, Aug. 11; **Orange Co.**, Limeberry pond, July 28. At a pumping station near Bluffton Eli Captain saw females of this species ovipositing in an oil pool; it was not determined if such females survive but one was seen to oviposit more than once.

122. *Pantala hymenaea* Say. **Clark Co.**, near Ohio River at Jeffersonville, Sept. 11. Four specimens of this species and one of *P. flavescens* were taken by H. Spieth who made this observation, "Insects flying in swarm about 100 feet from river in an old deserted, uncultivated, overgrown pasture which, in the spring, is very swampy."

132. *Tramea carolina* Linne. **Huntington Co.**, wood clearing near Salamonie River, June 9.

124. *Tramea lacerata* Hagen. **Huntington Co.**, upland pond near Salamonie River, June 9, pond at New Lancaster, July 21; **Orange Co.**, Limeberry pond, July 28; **Vigo Co.**, pond three miles south of Pimento, July 4; **Wayne Co.**, pond near Tuberculosis Sanitarium, July 28. "Several seen; pair ovipositing, male in usual attendance part of time, female alone and more industrious part of time," July 29, (E. B. W.).

125. *Tramea onusta* Hagen. **Orange Co.**, Limeberry pond, July 28; **Vigo Co.**, pond at Pimento, July 4.

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