

RECORDS OF INDIANA DRAGONFLIES—I.

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An annotated list of Indiana dragonflies¹, which gave the geographical and seasonal range within the state of all species known to occur was published by E. B. Williamson in 1917. A paper listing captures during 1917-1920 inclusive², which increased the known range, either seasonal or regional, of these species and added one species to the state list was published in 1920.

In the present paper captures of specimens in new localities and on different dates during the period 1921-1924 inclusive, are recorded. Three species not previously reported from Indiana are listed, bringing the state list to 129 species. I have added the records of my own captures during 1924 to the notes which Mr. Williamson gave me for tabulation; records of a few specimens in the collections of Purdue University are also included.

Unless stated otherwise all records from Gibson, Knox, Posey and Tippecanoe counties are based on specimens taken by me and now in my collection. Records from material in the Purdue collection are so indicated. All other records have been taken from E. B. Williamson's notes. The numbers used in Williamson's list of 1917 are followed in this paper.

3. *Agrion maculatum* Beauvois. Several specimens from Tippecanoe County, taken in May and June, 1923, are in the Purdue collection. Black River Creek, Gibson and Posey counties, July 4, 6, 1924. Vanemon Swamp, Wells County, June 22, 1924 (J. H. Williamson). This is the first record of an agrionine from this locality³.

4. *Hetaerina americana* Fabricius. Many from Tippecanoe County in Purdue collection. Marion County, near Indianapolis, May 27, 1921. White River, near Shoals, Martin County, September 4, 1924 (B. A. Porter). Wea Creek, near Indian Hill, Tippecanoe County, September 13, 1924. Mr. E. B. Williamson and I collected along the Wabash River at Bluffton, September 21 and 22, 1924, finding this species very common. On the latter date one of the specimens taken was teneral.

5. *Hetaerina titia* Drury. A male taken near Lafayette, September 23, 1922, by a student, (Purdue collection).

6. *Lestes congener* Hagen. Lafayette Township, Allen County (B. E. M.). Common at Vanemon Swamp, September 26, 1924, where Williamson and I observed a pair ovipositing in a stem of *Scirpus fluviatilis*

¹ E. B. Williamson. An Annotated List of the Odonata of Indiana, Miscellaneous Publication No. 2 of the University of Michigan, Museum of Zoölogy, 1917. 12 pp. 1 map.

² E. B. Williamson. Notes on Indiana Dragonflies, Proc. Ind. Acad. Sci., 1920, pp. 99-104.

³ E. B. Williamson. Two Days with Indiana Odonata. Ent. News, Vol. 32, 1921, pp. 19-23.

Torr. The pair moved down the stem depositing eggs at short intervals. The female was observed to straighten out her abdomen after each egg was inserted in the tissues of the plant. After the pair had moved down the stem several inches in this manner, they walked up the stem about a foot and began the process over again. This move was carried out in perfect unison; although we could observe no difference in their actions from those at other times until the move was begun, the pair started off up the stem as if by a prearranged plan instead of down the stem to insert another egg. This interesting movement was seen twice during the period of observation, about 20 minutes. A section of the plant containing eggs was brought to the laboratory and examined under the microscope. The eggs were inserted at intervals of $1\frac{1}{2}$ -4 mm. and pointed downward at an angle of about 45° with the surface of the stem. Most of them were inclined slightly either to right or to left, from the plane passing thru the line of punctures and the center of the stem. The egg is cigar-shaped, about 1.4 mm. long and .2-.3 mm. thick. One end is rounded, the other distinctly restricted to a narrow tip. It is greyish cream in color, brownish at the larger end and brown to black at the restricted end.

8. *Lestes eurinus* Say. Two males of this species were taken by sweeping a growth of water smartweeds in a pond near Decker, Knox County, July 13, 1924.

9. *Lestes forcipatus* Rambur. Near Lafayette, May 26, June 4, 27, 1923 (Purdue collection). Taken at several places in Knox County, June 3, July 18, 1924. Posey County, near Poseyville, July 4, 1924.

10. *Lestes inequalis* Walsh. Five miles east of Lagrange, June 5, 1921.

11. *Lestes rectangularis* Say. Pond near Poseyville, July 4, 1924. Gibson County, three miles north of Poseyville, July 6, 1924. Knox County, July 11, 18, 27, 1924. Foote's Lake, Gibson County, August 10, 1924.

12. *Lestes uncatus* Kirby. Near Indianapolis, May 27, 1921. Five miles east of Lagrange, May 21, 1921.

15. *Argia apicalis* Say. A single female from White River, near Shoals, Martin County, September 4, 1924 (B. A. Porter). Gravel pit, near Vincennes, August, 1924.

16. *Argia moesta* Hagen. White River, near Shoals, Martin County, September 4, 1924. (B. A. Porter).

18. *Argia tibialis* Rambur. Pond, Gibson County, three miles north of Poseyville, July 5, 1924.

20. *Argia violacea* Hagen. Near Indianapolis, May 27, 1921. Small pond near Fritchton, Knox County, July 18 and 26, 1924. Gravel pit, near Vincennes, August 2, 1924.

21. *Enallagma antennatum* Say. Near Indianapolis, May 27, 1921. Small ponds in Gibson County, two and one-half to three miles north of Poseyville, July 5 and 6, 1924.

24. *Enallagma calverti* Morse. Vanemon Swamp, Wells County, June 22, 1924; two males.

25. *Enallagma civile* Hagen. Near Indianapolis, May 27, 1921. Small pond in Gibson County, three miles northwest of Poseyville, July 6, 1924; very common, flying in pairs along the margin of the water or resting on tips of grass and weeds growing in the water. Gravel pit, near Vincennes, July 8, 13, August 3, 1924. Vanemon Swamp, Wells County, June 11, 15, 1922; a single male each day. The capture of this species at this swamp for the first time and the captures of *E. calverti* listed above are the only records of Enallagmas at Vanemon Swamp since 1920⁴.

26. *Enallagma cyathigerum* Charpentier. Pond, Gibson County, two and one-half miles north of Poseyville, July 6, 1924.

27. *Enallagma divigans* Selys. Near Indianapolis, May 27, 1921.

29. *Enallagma exulans* Hagen. White River, near Shoals, Martin County, September 4, 1924 (B. A. Porter). Black River Creek, three miles north of Poseyville, July 6, 1924.

30. *Enallagma geminatum* Kellicott. Near Indianapolis, May 27, 1921. One mile north of Vincennes, June 12, 1924. Gravel pit, near Vincennes, August 2, 1924.

34. *Enallagma signatum* Hagen. Gravel pit, near Vincennes, August 3, 1924.

37. *Nehalennia irene* Hagen. Slough along Salamonie River, near Mt. Etna, Huntington County, June 22, 1921.

38. *Amphiagrion saucium* Burmeister. Near Indianapolis, May 27, 1921.

39. *Chromagrion conditum* Hagen. Near Indianapolis, May 27, 1921. Slough along Salamonie River, Huntington County, June 22, 1921.

41. *Ischnura posita* Hagen. Near Indianapolis, May 27, 1921. Ponds, Gibson and Posey counties, two or three miles north of Poseyville, July 4, 5, 6, 1924; very common.

43. *Ischnura verticalis* Say. Gravel pit, near Vincennes, August 2, 3, 1924. Ponds in Gibson and Posey counties, two or three miles north of Poseyville, July 4, 5, 6, 1924; very common.

44. *Anomalagrion hastatum* Say. Pond in Gibson County, two and one-half miles north of Poseyville, July 6, 1924.

47. *Cordulegaster maculatus* Selys. Devil's Hollow, Allen County, July 6, 1924. A female taken while ovipositing in gravel in water $\frac{1}{2}$ - $\frac{3}{4}$ " deep, in a tributary of the Aboite River.

48. *Cordulegaster obliquus* Say. Near Indianapolis, May 27, 1921. Four males were taken of this species which had been taken in the state but once since Say's record in 1839⁵.

49. *Progomphus obscurus* Rambur. Near Vincennes, June 12 and July 3, 1924. The specimen, a teneral female, taken on July 3 was rest-

⁴Williamson, E. B. Two Days with Indiana Odonata. Ent. News, Vol. 32, 1921, pp. 19-23.

⁵Williamson, E. B. Notes on Indiana Dragonflies, Proc. Ind. Acad. Sci., 1920, p. 100.

ing on the tip of a dead weed a few feet from a gravel pit in the manner of *Celithemis elisa* which was common on that date.

50. *Hagenius brevistylus* Selys. A female from near Lafayette, undated (Purdue collection).

52. *Erpetogomphus designatus* Hagen. Two males were captured with my hat on the bare sand near Decker, Knox County, July 16, 1924. This species was common in a well-cultivated orchard near Vincennes, on August 7, 1924, resting on the ground with wings spread out against the soil but taking flight so readily that only three specimens were taken in two hours although I saw 20 or more.

52a. *Gomphus amnicola* Walsh. This species, new to the state list, was taken three times during the past summer; a male was captured in an orchard on the bluffs along the Wabash River, near Vincennes, June 27, a female was taken in an open field nearby on July 3 and a second male in the same locality as the first, August 7, 1924.

53. *Gomphus exilis* Selys. Five miles east of Lagrange, June 5, 1921.

56. *Gomphus fraternus* Say. White River, near Indianapolis, May 27, 1921. Four specimens from Tippecanoe County, undated, in Purdue collection.

58. *Gomphus graslinellus* Walsh. Canal, near Indianapolis, May 27, 1921. This species was found distributed along the Wabash River, Wells County, at pools as well as at narrow channels, July 17, 1923; one of the 16 males taken was feeding on a specimen of *Argia tibialis*. Posey County, near Poseyville, June 29, 1924 (R. W. Montgomery).

59a. *Gomphus rotatus* Rambur. Pond in Gibson County, three miles northwest of Poseyville, July 6, 1924; a single male making the first record of the species for the state.

59b. *Gomphus plagiatus* Selys. A female of this species, not previously known from the state was taken in an orchard, near Vincennes, July 2, 1924; two females were taken on July 3, and a male August 7, 1924, from the same localities as the specimens of *G. amnicola* captured on the same dates.

60. *Gomphus quadricolor* Walsh. Salamonie River, Huntington County, June 22, 1921.

64. *Gomphus vastus* Walsh. Dr. B. A. Porter and I found this species common in an orchard near the Wabash River, Knox County, June 5, 1924. It was taken here also June 9, 10, 29, 1924.

65. *Gomphus ventricosus* Walsh. Canal, near Indianapolis, May 27, 1921. Salamonie River, Huntington County, June 22, 1921. Eight species of gomphines were taken along the Salamonie River on this date; *Progomphus obscurus*, 1 male, 1 female; *Ophiogomphus rupinsulensis*, 1 male; *Hagenius brevistylus*, 1 male; *Gomphus fraternus*, 3 males, 1 female; *G. graslinellus*, 1 male; *G. crassus*, 1 female; *G. quadricolor*, 1 male; *G. ventricosus*, 1 female.

69. *Dromogomphus spoliatus* Hagen. Foote's Lake, Gibson County, August 10, 1924. Robert W. Montgomery and I found this species com-

mon on the bare rocks along the shore of the lake. Many mating pairs were seen, usually coming to rest in the grass several yards from the lake although two pairs were seen to come to rest in trees.

70. *Boyeria vinosa* Say. A female was taken at Bluffton, August 2, 1922, about 7:15 p. m., several minutes after sunset. It was flying back and forth through the spray from a hose being used to sprinkle a lawn in a yard that was quite dark because of surrounding houses and trees. The weather had been very dry for several days with a maximum temperature of 82°.

72. *Anax junius* Drury. Many in Purdue collection from Tippecanoe County. Several localities in Knox County, July 11-16, 1924. Small pond in Gibson County, three miles north of Poseyville, July 16, 1924 (R. W. Montgomery).

75. *Aeshna constricta* Say. Purdue collection, from Tippecanoe County, near Lafayette, September 20, 1914. "Happy Hollow", near West Lafayette October 5, 1924 (Robert W. Montgomery).

78. *Aeshna umbrosa* Walker. "Happy Hollow", October 5, 1924. A number of large dragonflies were hawking in an open space in the woods. Three taken were all different species, *Aeshna constricta*, *A. umbrosa*, and *Anax junius*. I spent about two hours watching them catch Diptera. As a dragonfly approached a small insect it checked its speed slightly and drew its head upward and backward until the mouth was in an anterior position. The prey was caught in the mouth and the mouthparts were seen to move rapidly as the dragonfly flew on leaving a vacant space where the smaller insect had been seen a moment before.

79. *Aeshna verticalis* Hagen. Vanemon Swamp, Wells County, September 26, 1924. A collecting party, consisting of Dr. F. M. Gaige, Mr. J. H. Williamson, Mr. E. B. Williamson and myself spent the afternoon at this swamp which has been intensively studied during the past 25 years as an example of the woodland swamp dragonfly fauna of Indiana, by E. B. Williamson. The water was about 12-15 inches deep in the swamp and fish were noticed by Mr. Williamson for the first time since he has had the swamp under observation. Many *Aeshnas* were flying over the water. Of 20 captured 16 were *A. constricta* and four *A. verticalis*, the latter never before taken here. With the other two species recorded for this locality for the first time in this paper the total list is now 34⁶.

80. *Nasiaeschna pentacantha* Rambur. Small pond, Gibson County, three miles north of Poseyville, July 5, 1924. Foote's Lake, Gibson County, August 10, 1924.

81. *Epiaeschna heros* Fabricius. Two females from Tippecanoe County, one undated, other April 1, 1923, in Purdue collection. While collecting the periodical cicada in wooded hills, four miles northwest of Stewartsville, Posey County, June 24, 1924, E. W. Montgomery and Robert W. Montgomery saw a dragonfly flying low over the ground carrying a large insect. Capture proved the dragonfly to be this species and its prey a cicada, *Tibicen septemdecim* Linn.

⁶ Williamson, E. B. Two Days with Indiana Odonata. Ent. News, Vol. 32, 1921, pp. 19-23.

83. *Macromia illinoiensis* Walsh. Open meadow among wooded hills, four miles northwest of Stewartsville, Posey County, June 2, 1924 (Robert W. Montgomery).

85. *Macromia taeniolata* Rambur. Foote's Lake, Gibson County, August 10, 1924. Probably 12 or 15 individuals were patrolling the shores of the lake, flying over spatter dock growth six to ten feet from the shore and three to five feet above the surface of the water. Robert W. Montgomery and I took four, all males.

87. *Epicordulia princeps* Hagen. Gravel pit, near Vincennes, August 3, 1924. Foote's Lake, Gibson County, August 10, 1924.

94. *Somatochlora linearis* Hagen. Two males of this rare species were taken along a small creek in Lafayette Township, Allen County, August 10, 1924, by Eli Captain and 25 males were collected at the same place two days later by A. L. Cook, J. H. Williamson and E. B. Williamson.

96. *Libellula cyanea* Fabricius. Gibson, Knox and Posey counties, June 8, July 21, 1924.

98. *Libellula incesta* Hagen. Foote's Lake, Gibson County, August 10, 1924.

99. *Libellula luctuosa* Burmeister. Gibson and Knox counties, June 25, August 10, 1924.

100. *Libellula pulchella* Drury. Two females from Green County, July, 1895, in Purdue collection. Near Indianapolis, May 27, 1921. Five miles east of Lagrange, June 6, 1921. Gibson and Knox Counties, June 8, July 27, 1924.

102. *Libellula semifasciata* Burmeister. Tippecanoe County, 1912 (Purdue collection). Near Indianapolis, May 27, 1924.

104. *Plathemis lydia* Drury. Near Indianapolis, May 27, 1921. Slough, along Salamonie River, near Mt. Etna, Huntington County, June 21 and July 31, 1921. Gibson, Knox and Posey counties, June 8, August 10, 1924. Small pool of water along road, near Lafayette, September 13, 1924.

105. *Perithemis tenera* Say. Common at gravel pits and ponds, Gibson and Knox counties, July 8, August 10, 1924.

107. *Erythemis simplicicollis* Say. Near Indianapolis, May 27, 1921. Gibson and Knox counties, June 8, August 10, 1924. While collecting Hetaerina and Sympetra along the Wabash River at Bluffton, September 22, 1924, I saw a bit of green flashing among the weeds and bushes on the bank. Upon capture I found it to be a female of this species which previously, had not been reported from the state later than August 10. A female taken at Foote's Lake, Gibson County, August 10, 1924, was eating a specimen of *Pachydiplax longipennis*.

108. *Sympetrum ambiguum* Rambur. Drainage ditch, near Ft. Wayne, August 20, 1922.

109. *Sympetrum corruptum* Hagen. Near Lafayette, May 13, 1923 (Purdue collection). Small creek, Lafayette Township, Allen County, September 21, 1924 (B. E. M.). Gibson County, July 16, 20, 1924. Near Lafayette, October 2 and 9, 1924.

111. *Sympetrum obtrusum* Hagen. Near Indianapolis, May 27, 1921. Tippecanoe County, October 5, 1924.

112. *Sympetrum rubicundulum* Say. Purdue University campus, Lafayette, October 17, 1924.

113. *Sympetrum semicinctum* Say. Buttonwood Swamp, Wells County, July 16, 1922. A male of this species, picked up on a walk, in Lafayette about 7:30 a. m., September 19, 1924, by R. W. Montgomery was apparently numb and inactive until brought into a warm room.

114. *Sympetrum vicinum* Hagen. Ponds, Knox County, July 6, 26, 27, 1924. Near Lafayette, October 2, 5, 19, 1925. A male taken in Greene County in 1912 is in the Purdue collection.

115. *Pachydiplax longipennis* Burmeister. Near Indianapolis, May 27, 1921. Gibson, Knox and Posey counties, June 8, August 10, 1924. At a pond in Knox County, near Decker, this species was present by the hundred in a growth of cattails, lotus and watersmart weed which had grown up in the pond.

118. *Celithemis elisa* Hagen. Near Lafayette, June 25, 1923, in Purdue collection. Small pond three miles northwest of Poseyville, July 16, 1924 (R. W. Montgomery).

119. *Celithemis eponina* Drury. Gravel pit, near Vincennes, August 3, 1924.

121. *Pantala flavescens* Fabricius. Gravel pit, near Vincennes, July 11, 18, and August 5, 1924. Small pond, three miles north of Poseyville, July 20, 1924.

122. *Pantala hymenea* Say. Gibson County, July 16, 1924. Near Vincennes, July 2, 1924 (B. A. Porter).

124. *Tramea lacerata* Hagen. Many in Purdue collection from Tippecanoe County, taken during May, June and September. Five miles east of Lagrange, June 5, 1921. Knox County, near Decker, July 11, 13, 1924.

125. *Tramea onusta* Hagen. Gravel pit, near Vincennes, July 11, 13, 1924.

