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THE NAIAD OF *CELITHEMIS MONOMELAENA*
WILLIAMSON (ODONATA: LIBELLULIDAE)

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DURING the summer of 1933, *Celithemis monomelaena* Williamson was found to occur at Third Sister Lake, about four miles west of Ann Arbor, Michigan. Its favorite haunt was noted at the time and revisited by the writer on June 12, 1934.

Third Sister Lake is of the second order; it is about 320 m. long by 150 m. wide, the long axis running from SW to NE. The locality preferred by *monomelaena* is near the southwest end, where the water is protected by a thick growth of trees and underbrush. For some distance from the boggy, *Carex*-grown shore the bottom of the lake is covered by a very thick layer of organic muck, which near the shore supports a dense growth of water lilies. In this region dragonfly naiads were abundant, especially those of *Argia violacea*, *Lestes vigilax*, *Gomphus exilis*, and *Leucorrhinia intacta*.

On the date mentioned, about 9:30 A. M., the writer came upon a male *Celithemis monomelaena* emerging from its larval skin. The naiad was clinging to a *Carex* stem only three inches above the shallow water, about two feet from shore. A short time later a female *monomelaena* was found emerg-

ing on the stem of a water lily leaf, about two inches above the water and a yard from shore. Both imagoes and exuviae were secured, and the imagoes kept alive for four days to permit development of mature coloration. A living naiad and two additional sets of exuviae of this species were collected the same morning.

The following description is based upon a series of four sets of exuviae and one mature naiad, all from the above

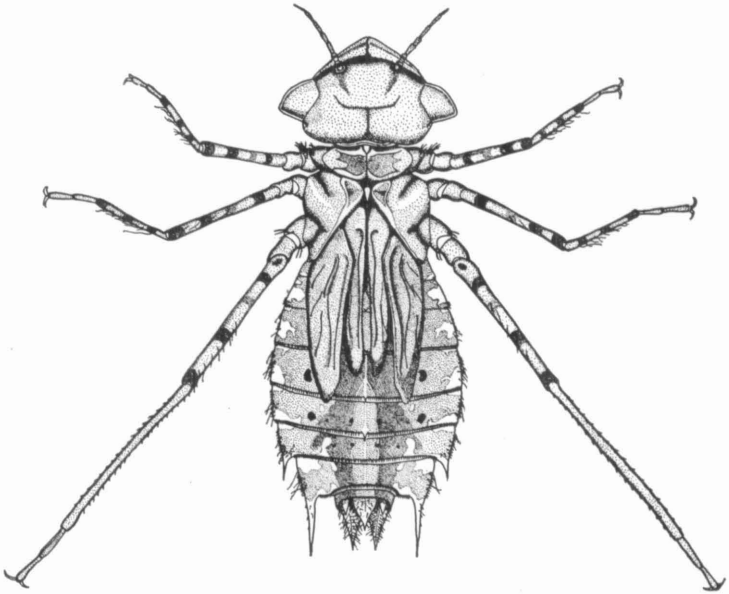


FIG. 1. Dorsal view of mature naiad killed as it was about to emerge.

locality, June 12, 1934, deposited in the collection of the Museum of Zoology, University of Michigan, Ann Arbor, Michigan.

COLORATION.—In all observed instances, dull greenish brown, the head, wing pads, and mid-lateral portion of the abdomen darker than the remainder of the insect. Legs and body slightly hairy. Abdominal segments 5–9 bear a dense row of minute setae on their apical margins. Abdomen with a very narrow, pale, mid-dorsal stripe, including the weak

dorsal hooks on segments 4-7. On either side of this stripe a slightly darker and broader irregular stripe, merging laterally with a very dark irregular stripe which gives place to a lighter area covering the outer half of the abdomen. Four minute black spots on segments 7-8, two larger brown blotches on 6-7. Two small transparent spots on 7 just posterior to the hind wing pads. Irregular transparent spots on the lateral margins of all segments. Legs obscurely marked with alternate light and dark bands. Lateral processes of 8 and 9



FIGS. 2-3. Labium and anal appendages, respectively, of the exuviae from which the male imago was observed to emerge. Figures by the author.

transparent. Caudal appendages dark at base, lighter apically (see Fig. 1).

HEAD.—Anterior margin of frons thickly fringed with long (0.5 mm.) hairs. Another row of slightly longer hairs between the bases of the antennae. Eyes prominent, acute, their posterior margins much nearer the rear than the middle of the head. Vertex moderately convex, surrounded by a shallow but well-defined fossa. Postero-lateral “angles” of head obtusely rounded, hairy. Posterior margin of head slightly concave. Antennae seven-segmented, the third segment about twice the length of the second and fourth, respectively.

Hinge of labium extending posteriorly to level of mesocoxae. Mentum (Fig. 2) at juncture of lateral lobes about three times as wide as at hinge. Thirteen mental setae on each side, the outer seven much longer than the inner six; the fourth from the outside longest of all. Anterior margin of mentum very finely crenulate, sparsely scattered with minute setae. Distal border of lateral lobe bearing eight very low, broadly rounded teeth armed with small setae, usually four to each tooth. Inner margin of lateral lobe bearing short setae of irregular length. Lateral setae, nine in all specimens observed. Movable hook slender, about half as long as the greatest width of the lateral lobe. Mentum and lateral lobes mottled with small blackish spots, a larger and more diffuse spot at the apex of the mentum and the inner angle of each lateral lobe.

PROTHORAX.—Relatively small, the outer angles projecting, the posterior border bilobate, convex.

SYNTHORAX.—Wing pads with inner margins almost parallel. Fore and hind wing pads extending to abdominal segments 6 and 7, respectively, in two specimens; to 5 and 6 in the remaining three.

ABDOMEN.—Elongate oval in shape, widest at segments 6-7, narrowing anteriorly and posteriorly, moderately convex in profile. Segments 4-7 bearing very small dorsal hooks, the largest on 7, that on 4 a mere tubercle. Lateral processes on segments 8-9, that on 8 about two-thirds the length of the segment, that on 9 about as long as 8 and 9 together. Those on both segments practically straight, slender, and very sharp. Epiproct triangular, sharply pointed, about three-fourths as long as the paraprocts. Cerci about half as long as the epiproct (Fig. 3). The paraprocts fall short of the apices of the lateral processes of segment 9 by about 0.25 mm.

MEASUREMENTS.—The following measurements, in millimeters, were taken on the series.

The following measurements were uniform in all specimens.—Greatest width of abdomen, 6.25; greatest width of head, 5.25; greatest width of mentum, 4.0; length of epiprocts, 1.25; length of paraproct, 1.5.

| | No. 1 (Exuv.) | No. 2 (Exuv.) | No. 3 (Exuv.) | No. 4 (Exuv.) | No. 5 (Naiad) |
|---------------------------|------------------|------------------|------------------|------------------|------------------|
| Total length | 17.0 | 16.5 | 16.0 | 15.5 | 15.0 |
| Length of abdomen | 11.0 | 10.0 | 10.0 | 10.0 | 9.75 |
| Length of wing pads | | | | | |
| Fore | 5.0 | 5.25 | 5.0 | 4.75 | 5.5 |
| Hind | 5.25 | 5.25 | 5.25 | 5.25 | 5.45 |
| Length of hind femur .. | 5.25 | 5.25 | 5.0 | 5.25 | 5.25 |
| Length of hind tarsus .. | 6.25 | 6.0 | 6.5 | 5.5 | 5.5 |
| Length of lateral process | | | | | |
| of 9 | 1.75 | 1.8 | 1.75 | 1.75 | 1.5 |
| Interocular distance | 2.5 | 2.75 | 3.0 | 2.75 | 2.75 |

Of the described naiads of *Celithemis*, that of *monomelaena* most closely resembles that of *fasciata*, as would be expected from the close similarity of their imagoes. The naiad of *monomelaena* differs from that of *fasciata*, as described by E. Broughton,¹ as follows:

| | <i>monomelaena</i> | | <i>fasciata</i> |
|---|--------------------|---|-----------------|
| Total length | 16.0 | (Average) | 18.0 |
| Length of abdomen | 10.0 | “ | 11.0 |
| Length of hind femur | 5.2 | “ | 6.0 |
| Width of abdomen | 6.25 | “ | 5.4 |
| Width of head | 5.25 | “ | 4.2 |
| Number of lateral setae | 9 | | 8-9 |
| Number of mental setae | 13 | | 10-11 |
| Dorsal hooks: Highest on seg. 7 | | Highest on seg. 6 | |
| Lateral processes: | | | |
| Seg. 8: $\frac{2}{3}$ length of 8 | | $\frac{1}{2}$ length of 8 | |
| Seg. 9: 0.25 mm. longer than paraprocts | | “reaching about to the tips of the appendages.” | |

In the genus *Celithemis* there remain undescribed the naiads of *amanda*, *bertha*, and *martha*.

¹“Some New Odonata Nymphs,” *Can. Ent.*, 60, 1928: 34.

