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PROTONEURA MACINTYREI, A NEW SPECIES OF
DRAGONFLY FROM ECUADOR (ODONATA:
PROTONEURINAE)

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In checking over protoneurine dragonflies in my collection for possible specimens of *Protoneura woytkowskii*, Leonora K. Gloyd decided the series of specimens described in this paper was new and closely related to *woytkowskii*, as is shown by the almost completely yellow ninth segment of the male abdomen.

P. woytkowskii was named for the professional collector, Mr. Felix Woytkowski, who collected seven males in Peru. I name the second and related species *Protoneura macintyreii*, for Mr. William Clarke-Macintyre, the professional collector in Ecuador, who has not only collected the type series but has also collected the females of *woytkowskii* and an excellent series of males of that species.

I wish to thank Mrs. Gloyd for orienting me in this group of Odonata and for sorting the material. The types will be deposited in the Williamson collection in the Museum of Zoology, University of Michigan. I have paralleled rather closely the description by Mrs. Gloyd and have followed her type of illustration. The contrasts of the protoneurine coloration have tempted us greatly.

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Protoneura macintyre, new species

(Plate I, Figures 1-9, and Plate II, Figures 1-7)

This is a minute dragonfly with a hairlike abdomen, with brilliant yellow-orange stripes on a black thorax, and the penultimate segment of the almost black abdomen a brilliant yellow or orange.

HOLOTYPE MALE

HEAD (Pl. II, Fig. 5, of female).—Labium white with apical segment of palp brown; labrum glossy black, its lower third white; bases of mandibles black with anterior edges white, these lines frame the two lateral edges of the labrum; anticypeus brown with a central and two lateral creamy specks; postclypeus glossy black; genae white, this color on each side forks under the antenna with a triangular white spot between the two tips of each fork (identical with the coloration of the genae and frons of the female as shown in Pl. II, Fig. 5). Frons, vertex, and rear of head jet black, except a minute triangular brown speck on vertex at each orbital edge just anterior to level of each lateral ocellus. Apex of segment 1 and basal third of segment 2 of antenna white.

PROTHORAX (see Pl. I, Figs. 3-4, of a paratype male which is slightly darker than the holotype).—Orange except for black as follows: middle two-fourths of anterior lobe black extending into the V-shaped anterior sulcus of dorsum of middle lobe; posterior lobe with a pair of triangular spots, one each at the level where the middle third joins each outer third; lower half of side of middle lobe with a broad black stripe (Pl. I, Fig. 3).

PTEROTHORAX (see Pl. II, Fig. 1, of a paratype male).—Color identical with that of Pl. II, Fig. 1. Black down to level of first lateral (mesometathoracic) suture with the following red-orange: two spots in antealar sinus, outer half of each mesepisternum (which are the broad, brilliant orange stripes of the upper face of the thorax), a minute triangle at upper end of humeral suture, and a smaller triangular spot on outer end of each wing of the mesostigmal lamina, the

lower edge of the mesinfraepisternum. Pterothorax below the first lateral suture (metathorax) orange, which shades into yellow on lower sides and ventral surface, with the following black or dark brown: a slight overrun of the black of the mesepimeron on the metepisternum along the upper third of the first lateral suture. A black stripe, two-fifths as wide as metepisternum along its posterior edge (anterior to second lateral suture), ending below in an acute point posterior to the metathoracic spiracle. Anterior edge of metepimeron with a narrow irregularly-edged dark brown stripe.

LEGS.—Coxae and femora yellow, the distal third of femur black, a dusky ring half way between coxa and inner end of black of tip (see Pl. I, Fig. 1). Tibiae slightly more brownish with apical sixth dark and a dusky ring at apex of basal third (the tibiae of holotype are much lighter than in Pl. I, Fig. 1). Tarsi black.

ABDOMEN.—Segment 1 lemon yellow with apical ring of brown which sends a brownish triangle cephalad along upper edge of side of segment, the dorsal yellow spot thus defined is not in the paratype male figured in Plate I, Figure 2; segment 2 lemon yellow on lower side, ventral laminae (anterior hamules) black, as is the apical ring. Upper two-thirds of segment black with a conspicuous orange spearhead along mid-dorsal line, its point at anterior end of segment, its base against the black apical ring. Segment 3 with a dorsal trifoliate orange spot at base, its lateral lobes not continuous with a triangular yellow spot below on either side of segment (in the paratype male figured, Pl. I, Fig. 2, the orange dorsal and yellow lateral spots join at the base of 3). Segment 3 otherwise black on dorsum and on middle sides, shading into dark brown below. Segments 4–7 each with a narrow, basal, pale ring but otherwise as in segment 3. Segment 8 black, pale (yellow?) along lower half of side, at anterior end the pale area widens to reach a point on the middorsal line. Segment 9 red-orange except a narrow apical black ring. Segment 10 and appendages black, except small obscure areas on side and the lower parts of both superior and inferior appendages pale.

PENIS (Pl. I, Figs. 8-9).—Without shaft hairs or spines, interior fold simple and nearly half as long as terminal segment. The latter with a pair of semicircular terminal lobes and with a pair of wavy lateral keels on the edges of its ventral surface. The edges of the latter yellow (sclerotized).

ABDOMINAL APPENDAGES (see Pl. I, Figs. 5-7, for the paratype which was drawn for color pattern).—Inferiors two-thirds as long as superiors, the latter in side view narrowly triangular; the dorsal contour horizontal, the ventral contour of main part angling up to the apex of the appendage; extending below the contour of the lower edge a broad low lobe whose acute apex is directed caudad. In dorsal view the superiors look more like two blackened, shrunken Irish potatoes than they do anything else. Their apices are blunt and curve slightly toward each other. The inferiors from the side are narrow, appear subcylindrical, and from base to apex slope slightly ectad and dorsocaudad. From below they are narrowly triangular, the base being the short side of the triangle.

WINGS.—With 11 postnodals in forewings and 9 in hind wings. M_2 originates at level of postnodal 5 in forewings and at level of 4 in hind wings. Cu_1 ends $2\frac{1}{2}$ cell lengths beyond outer end of quadrangle. Stigma brown, slightly oblique, its posterior and anterior sides subequal and equal in length to the cell below. Veins black.

Length of abdomen, 32.5 mm.; of hind wing, 19.50 mm.

ALLOTYPE FEMALE

HEAD (Pl. II, Fig. 5).—Color identical with that of male but white of face slightly tinged with bluish. In antenna apex of segment 1 pale but base of segment 2 not noticeably so. The two pale triangular specks next orbits on dorsal surface as in male but smaller, distinct but not noticeable unless sought.

PROTHORAX.—Dorsal surface from anterior edge to posterior edge black (Pl. II, Figs. 3-4). Pterothorax with antalar sinus black, and with the dorsal black stripe occupying the inner two-thirds of each mesepisternum instead of the inner half as in the male (Pl. II, Fig. 2). Pale stripe on metepi-

sternum narrower than that in male (compare Pl. II, Figs. 1-2). The pale areas of the pterothorax creamy yellow with a greenish tinge except the stripes on the mesepisternum which carry yellow with a faint trace of red, giving a very delicate brownish yellow effect. Pale of legs creamy. Pterostigmas dark brown.

ABDOMEN.—Dorsum of segment 1 a dull pale brown. Segment 2 colored as in the male, except the orange middorsal area reduced to a mere pinpoint of pale orange on middorsal line. Segments 3-7 similar in color to segments 4-7 of male. Segments 8-10 (Pl. II, Fig. 6) black with the following pale areas: oval spot covering lower half of side of 8 but not quite reaching apical border, sternum pale with a dark mid-ventral keel; 9 with a similar spot on lower side which touches neither base nor apex of the segment and which has a long finger-like lobe extending caudad and dorsad almost to middorsal line. Ovipositor largely pale but base of inner valves, apex of outer valves, and style black. Segment 10, cerci and periprocts black.

WINGS.—Ten postnodals in left forewing and 11 in right, 8 in each hind wing. M_2 originating, as in male, at level of postnodal 5 in fore and at 4 in hind wing. Cu_1 ends as in male about $2\frac{1}{4}$ cells from apex of quadrangle. Pterostigmas as in male. Teeth of valve of ovipositor (Pl. II, Fig. 7) are of two types, 14 narrow teeth preceded by 9 broader and shorter teeth.

Length of abdomen, 29 mm.; of hind wing, 20 mm.

There are twenty-nine males and two female paratypes. Nine paratype males have been checked for characters variable from those of the holotype male. The length of abdomen varies from 29 mm. to 35 mm., the average for the ten males measured is 32.05 mm.; in seven the abdomen varies from 31 mm. to 33 mm. The hind wing varies from 16.5 mm. to 21 mm.; average, 18.95 mm.; in seven it is from 18 mm. to 19.5 mm.

Five of the ten measured males have 11 postnodals in each forewing, four have 10 in each, and one has 10 in one and 11 in the other. In the hind wing five have 9 postnodals in both,

two have 8, and three have 8 in one and 9 in the other. In nine males M_2 originates at the level of the fifth postnodal in the forewings and at the fourth in the hind wings.

The two paratype females are very much like the allotype female. In one, length of abdomen, 19.5 mm.; in the other, 20 mm. In one, the hind wing is 29 mm.; in the other, 27.5 mm. One has 10 postnodals in each forewing, the other 11 in each; one has 8 postnodals in one hind wing and 9 in the other; the second has 8 in both hind wings. M_2 arises in all three females at the level of postnodal 5 in forewings and at 4 in hind wings.

The colors in this series are remarkably uniform. In the younger males the oranges tend toward a yellow stage. Segment 10 and appendages in the younger specimens may be distinctly reddish, but 10 is jet black in the old males. The holotype and the male figured for color appear to be intermediate.

The two paratype females have the pale dorsal stripes of the thorax with a distinctly reddish tinge, which is more pinkish than orange because of an element of blue in the pale colors of the thorax in the female.

This species is described from thirty males and three females collected by William Clarke-Macintyre in Ecuador, west of the Andes in the Provincia de los Rios, which is northwest of Guayaquil, and about 15 meters above sea level.

I follow Mrs. Gloyd's conclusions that the closest relative of this species is *Protoneura woytkowskii* Gloyd. Both occur in Ecuador; *woytkowskii* is east of the Andes, *macintyreii* is west of the Andes. Both differ from all species previously described in having segment 9 of the abdomen of the male yellow or orange. The male appendages are similar; but in *woytkowskii* the inferiors are longer than the superiors; in *macintyreii* the inferiors are shorter than the superiors. In *woytkowskii* the penis has a narrow apical lobe which is lacking in the penis of *macintyreii*.

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* Item not seen by me.

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PLATE I

Protoneura macintyreii, new species. Male, paratype. Provincia de los Rios, Ecuador. 15 meters. March 5, 1938. Wm. C. Macintyre, collector.

FIG. 1. Diagrams of leg color patterns.

FIG. 2. Segments 1 and 2 of abdomen.

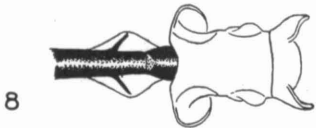
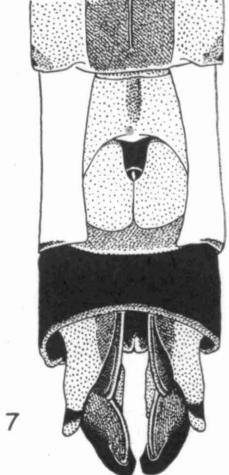
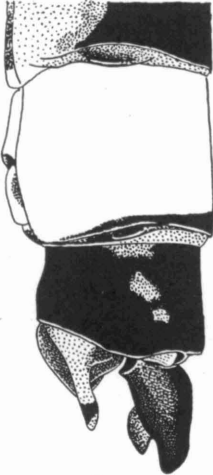
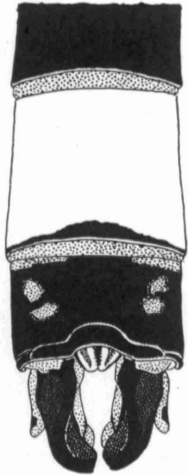
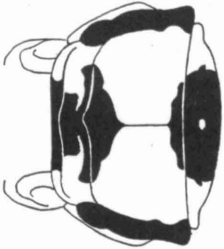
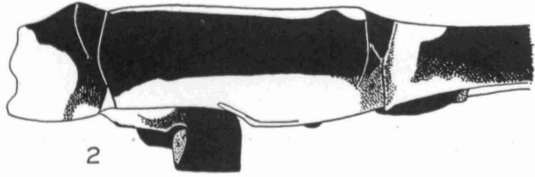
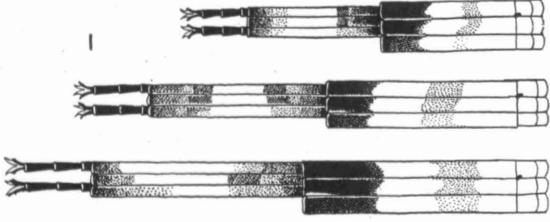
FIGS. 3-4. Prothorax.

FIGS. 5-7. Abdominal segments 9-10, and appendages.

FIGS. 8-9. Penis.

PROTONEURA MACINTYREI, A NEW SPECIES

PLATE I

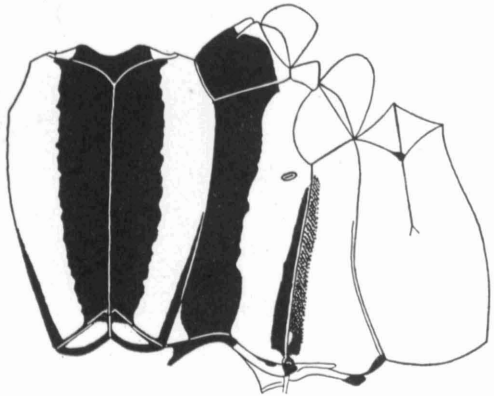


Clarence Hamilton Kennedy

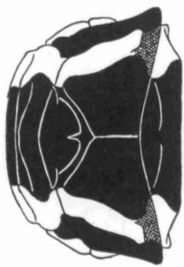
PLATE II

Protoneura macintyreii, new species

- FIG. 1. Color of thorax. Same male as in Plate I.
FIGS. 2-7. Female, allotype, same data as for the male figured.
FIGS. 2-4. Color pattern of thorax.
FIG. 5. Color pattern of head.
FIG. 6. Abdominal segments 8-10.
FIG. 7. Teeth on outer valve of genitalia.



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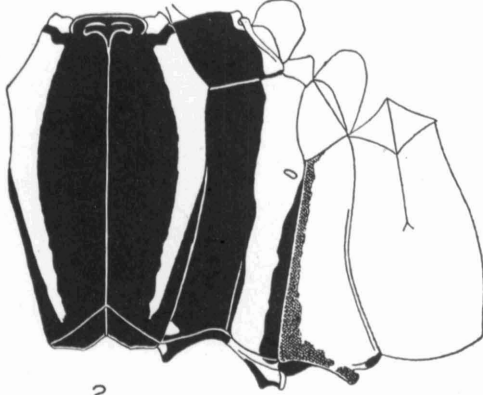
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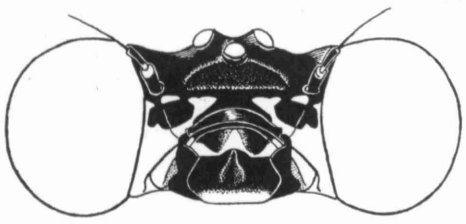
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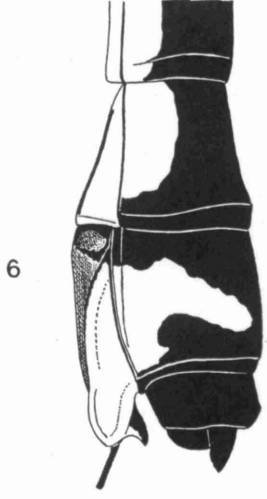
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