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of Mexico (Diptera: Dolichopodidae)

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Harold Robinson

Department of Botany, Smithsonian Institution,
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Paul H. Arnaud, Jr.

Department of Entomology, California Academy of Sciences,
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ABSTRACT: The distribution of the genus *Eulinia* is greatly extended—into the western Nearctic—by the description of two new species, *E. californica* from central California and *E. taeniocaudata* from British Columbia. Also included is a key to separate the five species presently known from America north of Mexico.

INTRODUCTION

The name *Eulinia* is applied to minute dolichopodid flies that are approximately 1 mm. in body length; they occur in wet areas and on moist substrates. Because of their minute size, they are easily overlooked in collecting, and it was not until 1932 that J. M. Aldrich described the first North American species. This was described from specimens collected primarily by the visiting dipterist—the late J. E. Collin of Newmarket, England, while he attended the Fourth International Congress of Entomology at Ithaca, New York, in 1928. The preoccupied name *Collinellula* Aldrich (1932, pp. 4–5) was first applied to this genus but this was corrected to *Eulinia* by Aldrich (1933, pp. 167–168). The name *Collinellula* was utilized by Curran (1934, pp. 221, 229) in his key to

genera of American Dolichopodidae. In the succeeding years two additional species have been described from the eastern United States by Robinson (1964, pp. 124-126).

The genus *Enlinia* is now reported for the first time from western North America. This is a great extension over its previous known range. In 1952 and 1969, the second author (Arnaud) and associates collected a series of over 240 specimens of a new species of *Enlinia* at Redwood City, California, and in 1968 Dr. Willis W. Wirth collected a second new species at Mount Revelstoke, British Columbia. The purpose of this paper is to provide names for the two new western enlinias and to publish a key for the separation of the five species that are now known from America north of Mexico. The greatest presently known concentration of species of *Enlinia* is in Mexico. Over 50 previously undescribed species have been collected in Mexico by the first author (Robinson, 1969).

SYSTEMATICS

Enlinia californica Robinson and Arnaud, new species.

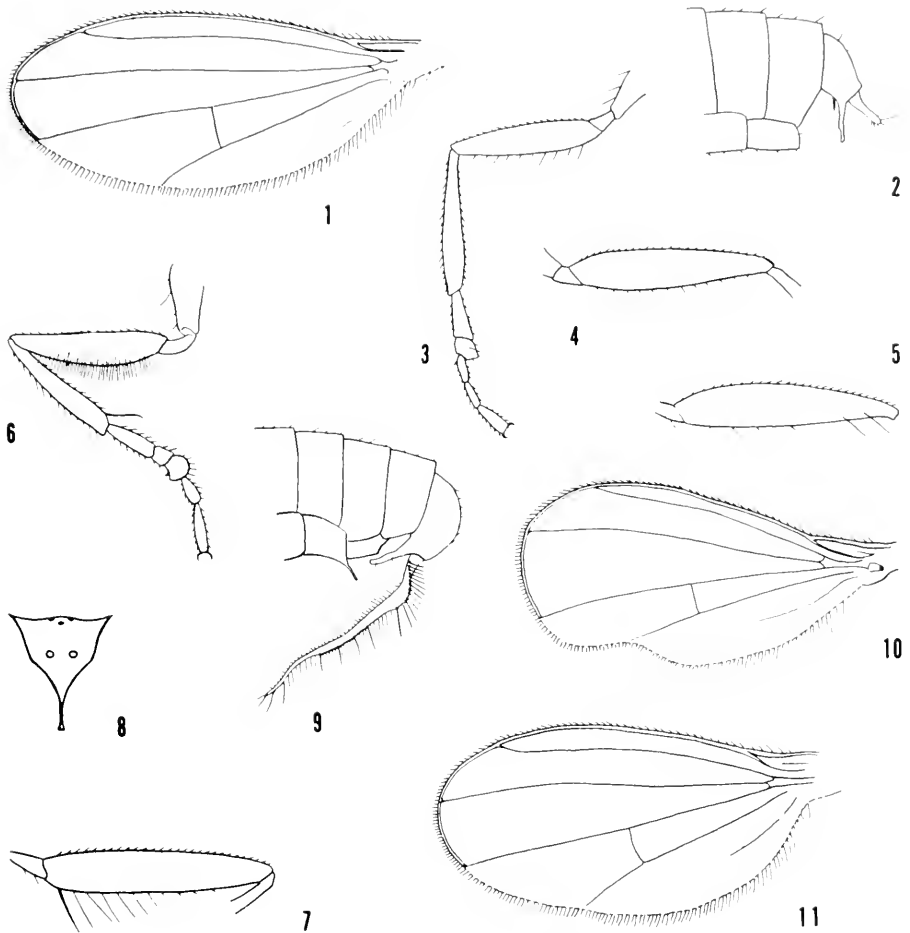
(Figures 1-5, 12, 13, 16, and 17.)

MALE. Length 1.1 mm; wing 1.1 mm by 0.4 mm. Face and front dark with slight metallic reflections, front with brownish pollen; eyes essentially contiguous below, anterior facets enlarged. Palpus and proboscis dark. Antenna black, all segments small, segment 3 blunt, arista half again as long as face.

Thorax dark, metallic, bluish green with brownish pollen, more brownish on pleura; setae dark with pale reflections; 6-7 pairs of acrostichals, 7-8 pairs of relatively small dorsocentrals; scutellum with hind margin evenly curved, with a pair of widely separated bristles.

Legs brownish with dark setae, tibiae and basitarsi rather yellowish brown. Fore coxa plain; ventral surface of fore femur (fig. 3) with a row of 9-10 evenly spaced erect setae about half as long as width of femur; middle femur (fig. 4) with row of about 12 evenly spaced erect setae ventrally almost as long as width of femur; hind femur (fig. 5) with 4-5 less erect black setae along ventral margin, only those near tip particularly long; tibiae plain, middle with 1 and hind with 3 minute dorsals. Fore tarsus (fig. 3) distorted, segments 1 and 2 somewhat compressed; segment 3 borne on anterior corner of 2, cylindrical with spicule bearing bulge at base anteriorly, segments 4 and 5 only slightly flattened, lengths of segments from base as 5-2-3-3-4; middle tarsus as 5-3-2-2-3; hind tarsus as 6-5-4-3-4.

Wing (figs. 1 and 12) narrowly elliptical, hind margin evenly rounded, anal angle not prominent, wing clear with veins brown; vein 2 slightly and evenly arched, curving slightly but distinctly forward at tip; veins 3 and 4 nearly straight, diverging from near base; crossvein perpendicular to vein 4, three-



FIGURES 1-11, *Enlinia* species. Figures 1-5, *E. californica*, new species: 1, male wing; 2, male abdomen; 3, male fore leg; 4, male middle femur; 5, male hind femur; figures 6-11, *E. taeniocaudata*, new species: 6, male fore leg; 7, male middle femur; 8, male face and front, anterior view; 9, male abdomen; 10, male wing; 11, female wing.

fourths as long as last part of vein 5; vein 6 represented by slight fold lying near anal margin. Knob of halter blackish.

Abdomen (fig. 2) slightly longer than thorax, cylindrical, somewhat compressed, blackish with brownish pollen and slight violet reflections, setae dark; sternites without accessory appendages. Hypopygium very small, capping tip of preabdomen, bearing a pair of short narrow lamellae which are pale at the base and blackish apically, each with about 5 apical setae; inner appendages small, brown, rodlike.



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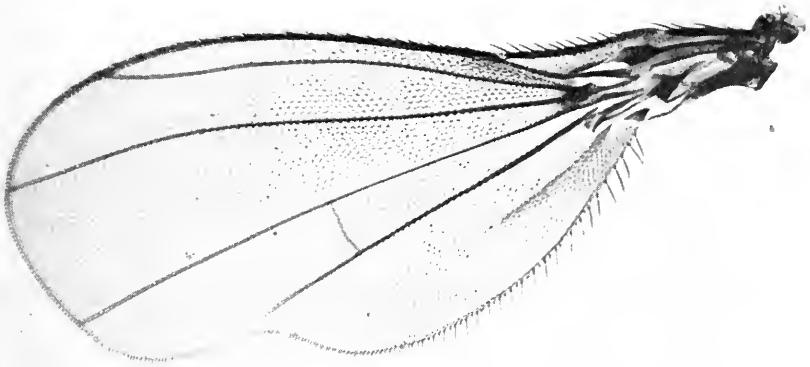


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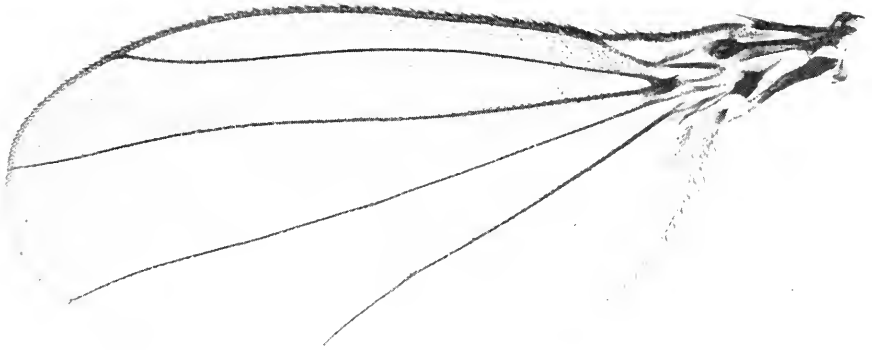
FIGURES 12 and 13, *Eulinia californica*, new species, wings; figure 12, paratype male; figure 13, paratype female. Photographs taken by Dr. Victor A. Zullo with a Nikon Photomicroscope and a Polaroid MP3 Land Camera.

FEMALE. Similar to male, but lower face as wide as antennal segment 1, anterior eye facets only slightly enlarged; femora without distinct ventral setae, fore tarsus plain, lengths of segments from base as 4-2-2-2-3; wings (fig. 13) as in male.

TYPE DATA. Holotype male, allotype female, 77 male and 164 female paratypes from the United States: California, San Mateo County, Redwood City, collected on the following dates and by the following collectors—27 males, 31



14



15

FIGURES 14 and 15, *Enlinia taeniocaudata*, new species, wings; figure 14, paratype male; figure 15, paratype female. Photographs taken by Dr. Victor A. Zullo with a Nikon Photomicroscope and a Polaroid MP3 Land Camera.

females, 23 and 29 March 1952 (P. H. Arnaud, Jr.), at spring; 6 males and 10 females at spring, 1 male and 11 females on rock wall at stream, 29 June 1969 (P. H. Arnaud, Jr.); 2 males and 6 females at spring, 26 males and 84 females on rock wall at stream, 6 July 1969 (P. H. Arnaud, Jr.); 15 males, 17 females, 6 July 1969 (Steven Dolezal), rock wall at stream; 5 females, 6 July 1969 (Michael Payton), rock wall at stream. The holotype and allotype, collected on 29 March, deposited in the type collection of the California Academy



of Sciences, Entomology type no. 10176. Paratypes in the collections of the California Academy of Sciences, United States National Museum and P. H. Arnaud, Jr. We would like to thank Steven Dolezal (age 12) and Michael Payton (age 11½) for their interest and aid in collecting a portion of the type series of this minute fly.

TYPE LOCALITY. The type series of *Enlinia californica* was collected on the wet rock surfaces of a wall impounding the waters of a spring on a serpentine hillside (fig. 16) and on a wet rock wall (fig. 17) below the spring over which the spring waters join the stream, in the foothills southwest of Redwood City. The spring, on a NNW. slope above a small permanent stream known as Arroyo Ojo de Agua, is in an area that is now a recreation park named Stulsaft Park. The elevation of the spring is about 50 meters. The rock wall that surrounded the pool of water at the spring has since 1952 been purposely broken.

REMARKS. *Enlinia californica* is related to a group of rather inornate species that is widely distributed in Mexico. Three of these as yet undescribed Mexican species show rows of setae ventrally along the femora of the males, but all differ by details of the third segment of the male fore tarsus and of the hypopygial lamellae. Also, one of the Mexican species has the scutellar bristles closer together, while the other two have rather distinct erect short setae ventrally on the male middle tibiae.

***Enlinia taeniocaudata* Robinson and Arnaud, new species.**

(Figures 6–11, 14, and 15.)

MALE. Length 1.2 mm; wing 1.1 mm by 0.5 mm. Face and front blackish with slight bluish reflections; eyes essentially contiguous below, anterior facets somewhat enlarged. Palpus and proboscis black. Antenna black, all segments small, segment 3 blunt, arista nearly half again as long as face.

Thorax dark, metallic, bluish green with blackish pollen; setae dark with pale reflections; 9–10 pairs of acrostichals, 9–10 pairs of relatively small dorsocentrals; scutellum with hind margin evenly curved, with a pair of widely separated large bristles.

Legs blackish with dark setae. Fore coxa plain; ventral surface of fore femur (fig. 6) completely covered with many erect hairs that are nearly as long as width of femur; middle femur (fig. 7) with row of erect setae below.

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FIGURES 16 and 17, type locality of *Enlinia californica*, new species; figure 16, spring with broken rock wall on serpentine hillside, Arroyo Ojo de Agua, at Redwood City, California; figure 17, stone wall along Arroyo Ojo de Agua, below hillside spring at which most of the 1969 series was collected. The enlinias rest on the wet surface of the wall and fly or hover only a very short distance from this wall.

basal seta stout and longer than width of femur, following setae more slender and progressively shorter; hind femur plain; fore tibia rather thick, bearing long sinuous bristle below at apex (fig. 6); middle and hind tibiae plain without distinct dorsal setae. Fore tarsus (fig. 6) distorted, segments 1 and 2 somewhat thickened, segment 3 fattened and asymmetric, bearing spicule on concave anterior margin, segment 4 and especially 5 slender, lengths of segments from base as 4-2-3-3-4; middle tarsus as 7-4-3-2-2; hind tarsus as 6-7-5-4-4.

Wing (figs. 10 and 14) generally obovate with broad shallow sinus in hind margin at tip of vein 5, clear with brown veins; vein 2 rather close to costa, scarcely turned forward at tip; vein 3 bending distinctly backward in last part, ending at tip of wing; vein 4 strongly divergent from 3, nearly straight; cross-vein rather short, half as long as last of vein 5; vein 6 represented by slight streak of color, lying in from margin; setae of hind margin rather short. Knob of halter black.

Abdomen (fig. 9) slightly longer than thorax, cylindrical, blackish with slight bluish reflections, setae dark; sternite 3 with slender erect projection from middle of hind margin. Hypopygium small, capping tip of preabdomen, brown; with a pair of very long slender ribbonlike lamellae, each with a crest of strong black setae near base and a few more widely spaced black setae distally along outer margin, fringes of smaller pale hairs along both margins; with a pair of shorter rodlike inner appendages.

FEMALE. Very plain compared to male. Eyes not contiguous, anterior eye facets not much enlarged, face about as wide below as antennal segment 1. Legs without distinctive setae ventrally on fore and middle femora or apex of fore tibia, fore tarsus plain, lengths of segments as 6-2-2-2-4. Wing (figs. 11 and 15) broadly elliptical, vein 2 curving inward from costa slightly in distal part, vein 3 less strongly curved, ending before wing tip, vein 4 less divergent, cross-vein longer, two-thirds as long as last of vein 5.

TYPE DATA. Holotype male, allotype female, 8 male and 5 female paratypes from Canada: British Columbia, Mt. Revelstoke, seepage, about 915 meters, 1 July 1968. W. W. Wirth, deposited in the collection of the United States National Museum, type no. 70715. One pair of paratypes deposited in the collection of the California Academy of Sciences.

REMARKS. *Eulinia taeniocaudata* has the greater number of acrostichal and dorsocentral setae that are characteristic of some of the more ornate species of the genus. *Eulinia saxicola* of the eastern United States and an undescribed species from Mexico have a combination of modified male wing and plain fore coxa and they might be rather closely related, but neither has a sinus on the hind margin of the wing or elongate hypopygial lamellae. Our thanks are extended to Dr. Willis W. Wirth for making this new species available for our studies.

The following key will separate the five species of *Enlinia* presently known from the United States and Canada.

KEY TO *ENLINIA* SPECIES OF AMERICA NORTH OF MEXICO

1. Abdomen dark metallic green, at least at base; with long accessory appendages on abdominal sternites 3 and 4 of male, appendage on sternite 4 forked 2
Abdomen brown or black with only slight metallic reflections; with accessory appendages of male abdominal sternites single, small, or lacking 3
2. Segments 1 and 2 of tarsi mostly white; wing of male not modified; face of female very narrow below, eyes nearly contiguous (eastern U. S., Mexico)
..... *E. ciliata* Robinson
- Legs wholly dark; wing of male highly modified, base narrowed, veins distorted, and clusters of hairs on surface; face of female distinct to mouth, nearly $\frac{1}{2}$ as wide below as above (northeastern U. S., Canada) *E. magistri* (Aldrich)
3. Thorax with 9-10 pairs of dorsocentrals; wing of male with broad sinus at end of vein 5; abdominal sternite 3 of male with long spur (British Columbia)
..... *E. taeniocaudata*, new species
- Thorax with 7-8 pairs of dorsocentrals; wing of male without sinus in hind margin; abdominal sternites of male with little or no ornamentation 4
4. Male middle femur with three prominent setae clustered at the base ventrally; abdominal sternite 4 of male bearing small projection; anal lobe of male wing very narrow (eastern U.S.) *E. saxicola* Robinson
- Male middle femur with a fringe of about 12 evenly spaced erect setae ventrally; abdominal sternites of male plain; wings of male and female alike (California)
..... *E. californica*, new species

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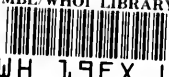
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