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FOSSIL ARTHROPODS OF CALIFORNIA  
NO 23. SILICIFIED INSECTS IN MIOCENE NODULES  
FROM THE CALICO MOUNTAINS.

By W. DWIGHT PIERCE

In No. 22 of this series (Bull. So. Calif. Acad. Sci. 58:72-78, 1959), the writer presented a general report on studies of fossils found in calcareous petroliferous nodules of Miocene age in Southern California. Recovery of the fossils has continued, with particular concentration on the nodules from the Calico Mountains. The vast amount of material accumulating, both in the Los Angeles County Museum laboratory, and in that of Mrs. Ruth Kirkby, at her home in Riverside, California, necessitates breaking down the results in short papers as rapidly as accurate reports can be prepared. The present paper includes some of the rarer finds in several orders: Collembola, Ephemera, Plecoptera, Corrodentia, and Coleoptera.

Order COLLEMBOLA Lubbock 1873.

Although the oldest known fossil insect remains recorded are Collembola from the Devonian of England, fossils in this order are very rare. Handlirsch (1906. Die Fossilien Insekten. V Lief.: 678, 679) lists seven of the Suborder Arthropleona, and three of the Suborder Symphypleona from the Lower Oligocene Baltic amber. It is with pleasure that a three-dimensional crystalline springtail from the Miocene is added to the Arthropleona.

Suborder ARTHROPLEONA Börner 1901.

Superfamily ENTOMOBRYOIDEA Womersley 1933.

Family ENTOMOBRYIDAE (Tömösvary 1883) Gisin 1944.

Tribe ENTOMOBRYINI Börner 1906.

Genus ENTOMOBRYA Rondani 1861.

**Entomobrya (Entomobrya) Kirkbyae**

New Species

(Figures 1, 2)

HOLOTYPE. No. 5-303. Ruth Kirkby collection, Kirkby private Museum, Riverside, California. From Kirkby site 2 (float), in Upper Switchback Cañon, NW ¼ Section 19, R.2.E., T.10.N., Calico Mts., Yermo Quadrangle, San Bernardino County, California. The photograph (Figure 1) slightly retouched by the author, while studying the specimen under the microscope, gives a good representation of the specimen, which is complete except for parts of the legs and antennae.

DESCRIPTION. Length of body 1.00 mm; length of body with extended manubrium 1.50 mm.

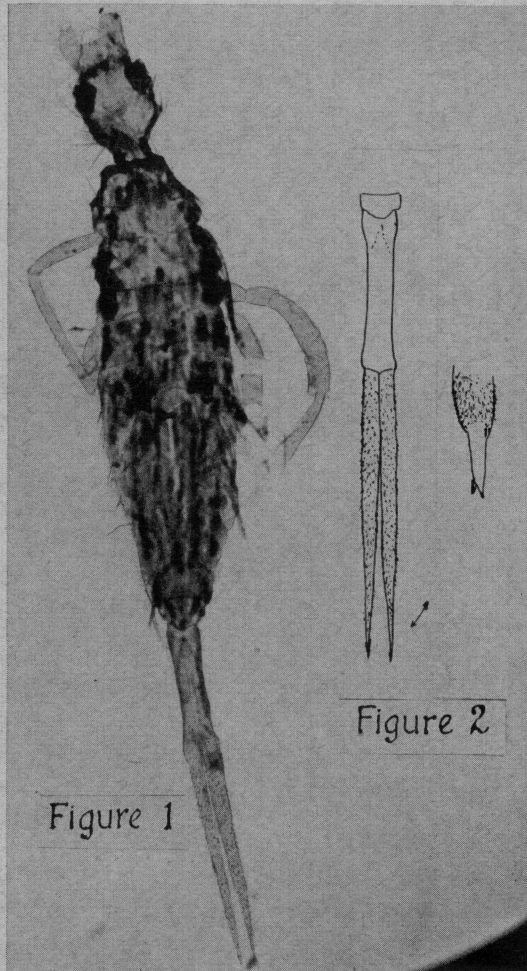


PLATE 14

Figure 1. *Entomobrya kirkbyae*, new species, type, actual length 1.5 mm. Photomicrograph by Edwin Horne.

Figure 2. *Entomobrya kirkbyae*, drawing by author of manubrium and dentes, with enlargement of mucro at tip of dentes. Size 0.5 mm.

Head elongate, in the proportions of: total length 28, frons and clypeus 8.5, eyes 7.5, behind eyes 9.5; width: clypeus 4, frons at base 10.5, head at eyes 17.5, vertex between eyes 7, occiput before narrowing 16, at apex 8.2. Prothorax length 4; width 8.5. Mesothorax length 17; width anterior portion 15, posterior portion 24. Metathorax length 11.5; width 28.5. First abdominal length 5.2; width 29. Second abdominal length 10; width 30. Third abdominal, length on median line 8.5; width 30. Fourth abdominal, length 39.5; width diminishing from 30 to 16.5. Fifth abdominal, length 7.5; width 14.5. Sixth abdominal length 7; width 10. Manubrium, length 25; width at base 7, narrowing at middle to 6. Dentes with mucro, length 52; width of single dens at base 3.5. All of these measurements are proportionate and obtained from photograph by centimeter calipers.

The head and body are sparsely clothed with long hairs. A great cluster of strong bristles on prothorax reaches forward over back of head. The dentes are minutely clothed with a short, fine pubescence. Frons and labrum show indistinctly between the bases of the antennae. Only basal joints of antennae are present. The eye patches are large and black, but the separate ocelli are not decipherable. The occipital area behind the eyes is longer than the eyes, and is abruptly angularly narrowed to the necklike prothorax.

Side margins of prothorax, also anterior margin and side margins of anterior half of mesothorax (scutum) sharply impregnated with black pigment. The scutal or anterior portion is almost twice as wide as prothorax at base, then curving abruptly widens to the wider posterior or scutellar portion. There is indication that the metathorax is evenly divided into scutum and scutellum.

Abdominal segments I, II, and III are short; while segment IV is much longer dorsally than the three combined, and four times as long as III. (From this we derive that the antennae are 4-segmented.)

The manubrium and dentes are together very long and slender, in the proportion to the rest of the body, as 4:7. The dentes are about twice as long as the manubrium, and taper to the tip. With difficulty, due to the transparency of the specimen, the mucro was seen at tip, and it seems to have a tooth as shown in sketch (Fig. 2).

The ventral lobe is short; the hamulus is indistinct.

This fossil species belongs to the group of cosmopolitan species of springtails, including *E. (E.) marginata* Tullberg (1871), and *E. (E.) atrocincta* Schött 1897. The latter is recorded as a present-day inhabitant of stagnant water pools in California.