

THE NYMPH OF *BISANCORA RUTRIFORMIS* SURDICK
(PLECOPTERA: CHLOROPERLIDAE)¹

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Abstract.—The previously unknown nymph of the stonefly *Bisancora rutriformis* was collected at its type locality, reared, and is described and illustrated herein. Preliminary comparisons, based on similarities of pronotal setation and mouthparts between it and nymphs of the other seven genera of the subfamily Chloroperlinae indicate that *rutriformis* is most closely allied with *Alloperla*. This corroborates relationship of these two genera based on adult genitalia.

In 1978, K. W. Stewart and B. P. Stark began a program to rear and comparatively describe and illustrate the unknown and poorly known nymphs of North American stonefly genera to enable: (1) construction of the first complete generic-level nymph key, and (2) acquisition of new nymphal characters that could be used as additional lines of evidence for phylogenetic analyses of Plecoptera. Since then, they and colleagues have described and illustrated for the first time nymphs in the genera *Calliperla* (Perlodidae) (Szczytko and Stewart, 1984), *Cascadoperla* (Perlodidae) (Szczytko and Stewart, 1979), *Chernokrilus* (Perlodidae) (Stewart and Stark, 1984), *Lednia* (Nemouridae) (Baumann and Stewart, 1980), *Oconoperla* (Perlodidae) (Stark and Stewart, 1982b), *Viehoperla* (Peltoperlidae) (Stark and Stewart, 1982a), representative nymphs for all genera in the Peltoperlidae (Stark and Stewart, 1981) and Perlodinae (Stewart and Stark, 1984), and nymphs of the species of *Taeniopteryx* (Fullington and Stewart, 1980).

The only remaining nearctic genera with unknown nymphs are *Hansonoperla* Nelson (Perlidae) (Nelson, 1979) and *Bisancora* Surdick (Chloroperlidae) (Surdick, 1981b). On May 13, 14, 1984, K. W. Stewart and B. Poulton visited Little Rock Crk., Los Angeles Co., Calif., the type locality of *Bisancora rutriformis* Surdick, and adjacent streams in the San Gabriel Mts. They collected the following *B. rutriformis* specimens: (1) 1 mature ♂ nymph, 13 ♂ and 6 ♀, Little Rock Crk., 6.3 mi. S. Hwy. 138 (Pearblossom Hwy.) on Cheeseboro Rd. (2.4 mi. S. Little Rock Dam) 13-IV-1984, and (2) 1 ♀ nymph, 4 ♂ and 2 ♀, Little Rock Crk. between Basin and Sycamore campgrounds, 14-IV-1984. The female nymph was field-reared in a styrofoam ice chest. The following description and figures were prepared from the single male nymph, and nymphal exuvium from the reared female.

With B. P. Stark we are currently engaged in a comparative study of chloro-

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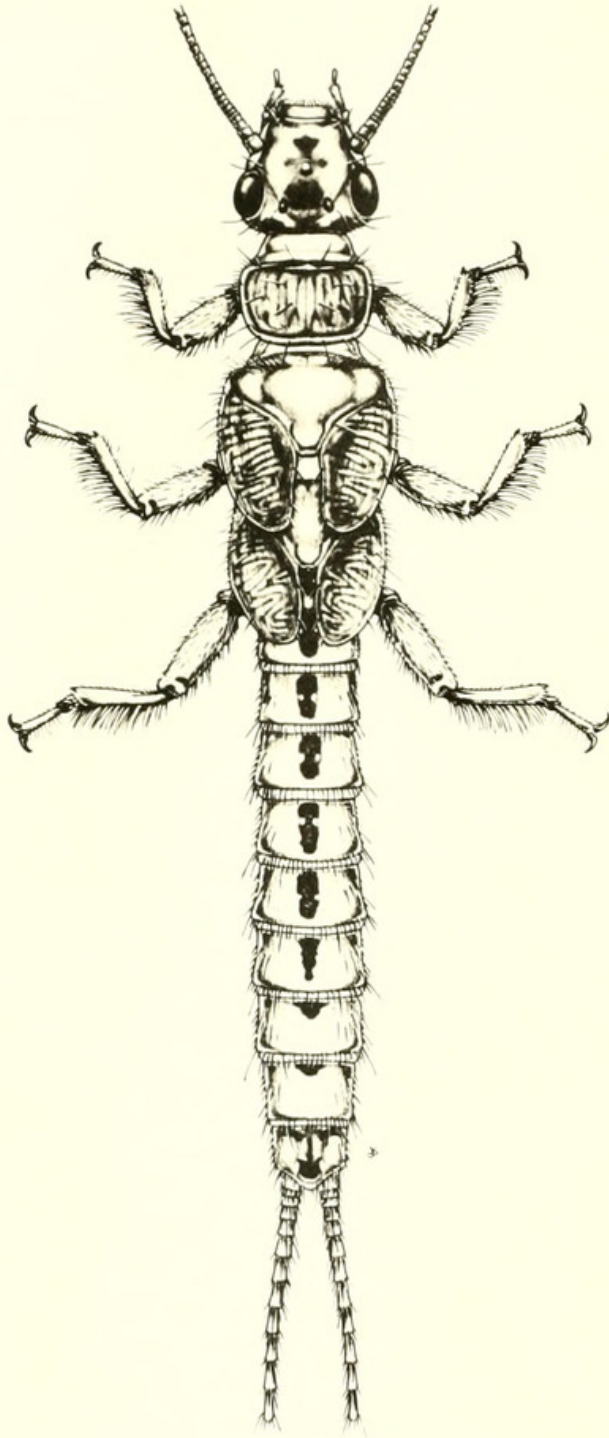


Fig. 1. Nymph habitus of *Bisancora rutriformis*; scale line = 2 mm.

perlinae nymphs, which should help to further elucidate generic relationships in this group. Morphological gaps between several genera are relatively small in all life stages; for example, the epiproct differences (which should carry heavy weight in character analysis) between species of *Bisancora*, *Alloperla* and some *Sweltsa* seem sufficiently subtle to raise questions about their placement in separate genera. A careful comparative study of all life stages is needed for acquisition of additional characters in the group.

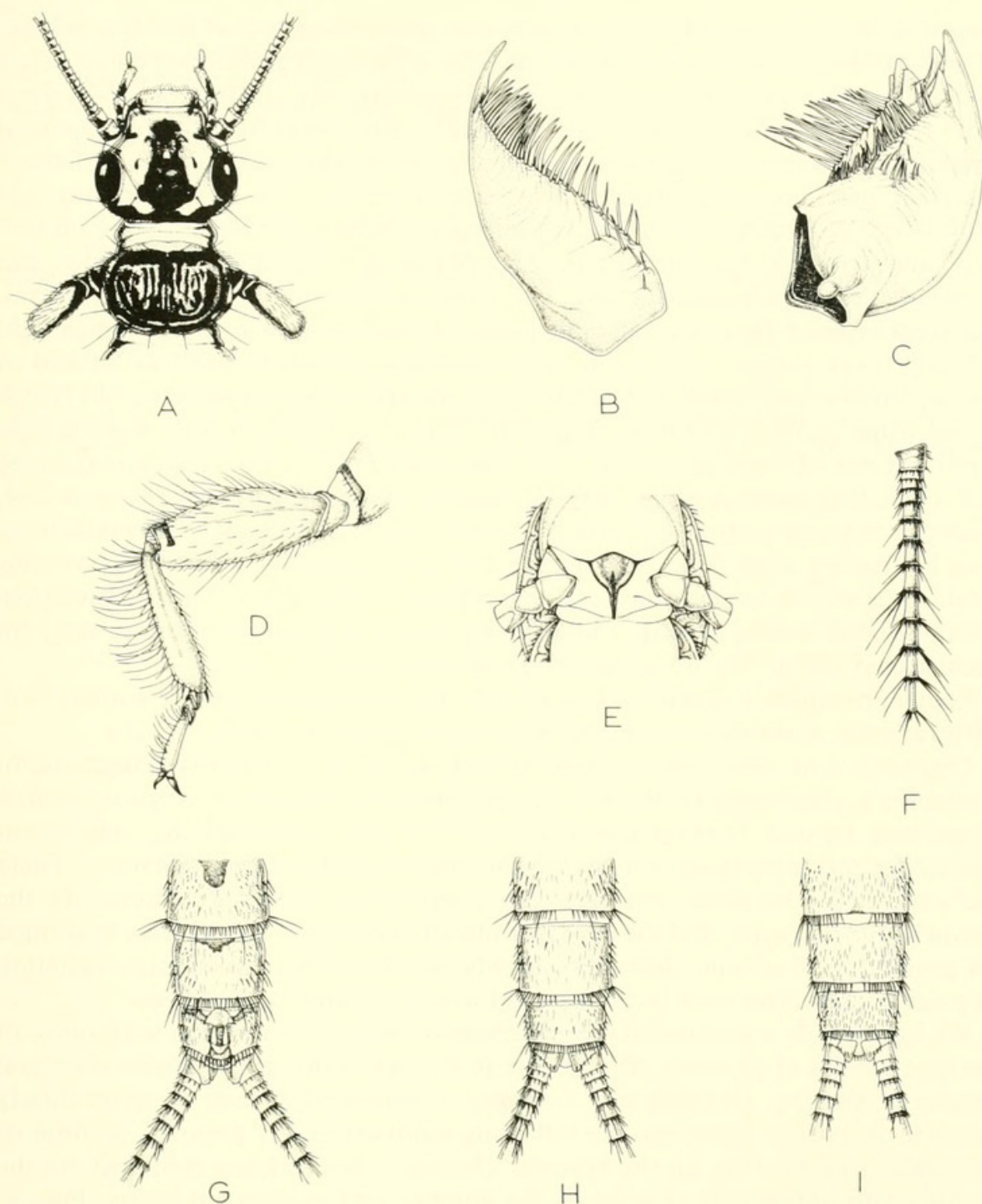


Fig. 2. Nymph characters of *Bisancora rutriformis*. A, Head-pronotum. B, Right lacinia (ventral). C, Right mandible. D, Right front leg (anterior). E, Mesosternum with Y-pattern. F, Right cercus (lateral). G, ♂ abdomen (dorsal). H, ♂ abdomen (ventral). I, ♀ abdomen (ventral).

Bisancora rutriformis nymph

Mature male nymph (Fig. 1). — Length 5.0 mm; general color yellow with light brown markings; body covered with long clothing hairs. Dorsum of head yellow with light brown patch enclosed within ocellar triangle, extending forward medially on frons; occiput with posterior light brown transverse band; antennae yellow; 2

long setae anterior and posterior to eye, and single, long seta at anterior corners of frons and outside each lateral ocellus (Fig. 1). Ventral and dorsal cusps of left mandible each with 3 unserrated teeth and median ventral patch of 12–14 stout hairs (Fig. 2C). Laciniae with single terminal tooth, about 0.25 the total lacinial length; thickset row of long, stout setae below tooth and continuous row of stout, marginal setae; submarginal basal row of 6–8 stout setae (Fig. 2B). Pronotum light brown with darker rugosities (Fig. 1); lateral pronotal setae absent; setae on corners, and a medial pair on anterior and posterior margins (Fig. 1). Meso- and metanota yellow; wingpads brown, with irregular short to medium length lateral, marginal setae; a few long setae on posterior and inner wingpad margins, and dorsally. Legs yellow, with partial transverse dorsal brown band distal end of femur; femorae and tibiae with scattered medium to long surface setae and sparse dorsal fringe of long, fine hairs (Fig. 2D). Y-arms of mesosternum meeting posterior corners of furcal pits; transverse ridge distinct (Fig. 2E). Abdominal tergae 1–9 with dark median stripe (Fig. 1); lateral stripe present on segments 1–4; posterior margins with row of median to long setae; a few mostly lateral short to long intercalary setae (Fig. 2G); sternae 8–9 with medially-interrupted posterior setal row; sternum 10 posterior setal row complete (Fig. 2H). Cerci 12-segmented, with posterior circlets of hairs and 2–3 long dorsal and ventral posterior setae on each segment (Fig. 2F); no dorsal fringe of silky hairs.

Female nymphal exuvium.—Length 6.0 mm. Abdominal sternae similar to ♂, with medially-interrupted posterior setal row or segments 8–9 (Fig. 2I).

Diagnosis and discussion.—There is little basis for a definitive diagnosis of *Bisancora*'s relationship to the other seven Chloroperlinae genera, based on nymph characters. Surdick (1981a) and Fiance (1977) have provided the only recent generic-level comparisons and keys to the other nymphs of this subfamily. There are ambiguities between some key characters and referred illustrations in the Surdick (1981a) paper, and she gave no indication of which species were examined for generation of nymph characters, or whether there was interspecific variation in generic characters used in the key and written nymph descriptions.

We have made a preliminary comparison of *Bisancora* nymphs with those of the type species of all seven other genera in the subfamily, and nymphs of several species of *Sweltsa*, *Alloperla* and *Triznaka*. It appears that they are most closely allied to *Alloperla*, based on the following similarities: (1) pronotal setation of *Alloperla* is exclusively on the corners; *Bisancora* has setation primarily on the corners with only a pair of setae on the anterior and posterior margins (Figs. 1, 2A), (2) *Alloperla* and *Bisancora* both have a close-set comb of socketed teeth just below the major terminal lacinial tooth (Fig. 2B). Nymphs of the other seven genera have numerous fringe hairs at least on the posterior pronotal margin, and no close-set comb of socketed teeth immediately below the major terminal lacinial tooth.

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