

**CAPNIA CARYI, AN INTERESTING NEW SPECIES OF
WINTER STONEFLY FROM THE AMERICAN SOUTHWEST
(PLECOPTERA: CAPNIIDAE)**

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ABSTRACT.—*Capnia caryi*, a new species of Nearctic Capniidae, is described from adults collected from high-elevation locations in the Southern Rocky Mountains of southern New Mexico and Arizona. Males are distinguished by their rounded club-shaped epiproct and sclerotized knobs on abdominal terga 8 and 9. Females possess a darkly sclerotized subgenital plate that covers most of tergum 8 and is produced posteriorly as a pair of broadly rounded lobes.

Key words: Plecoptera, stonefly, Capniidae, *Capnia caryi*, American Southwest.

Very dry years have characterized the American Southwest in the late 1900s and early part of the 21st century. The reduced amount of snowfall during these years has enabled collectors to gain access to streams at high elevations that were otherwise usually inaccessible. In 1999 the mountains in the Mogollon Rim Complex of the Gila Wilderness Area received only 5% of the normal winter snowpack (P. Stewart, U.S. Forest Service, personal communication).

Winter stoneflies have been the object of increased collecting efforts since the formation of the western chapter of the Winter Stonefly Club in the 1980s as part of a revision of the genus *Capnia* (Nelson and Baumann 1989). Previous studies of winter stoneflies in New Mexico include Jacobi and Baumann (1983), Jacobi and Cary (1986, 1996). Because this interest has continued in many areas of the West, with the collection of new material one can easily compare specimens with the named species. When these different specimens from the Southwest were found in the winters of 1999 and 2001 at high-elevation locations in Arizona and New Mexico, it was determined that they represented a previously undescribed *Capnia* species.

***Capnia caryi*, new species**

MALE.—Wings brachypterous. Length of forewings 3.5–4.0 mm; length of body 5.0–6.0 mm. Body and appendages dark brown; wings

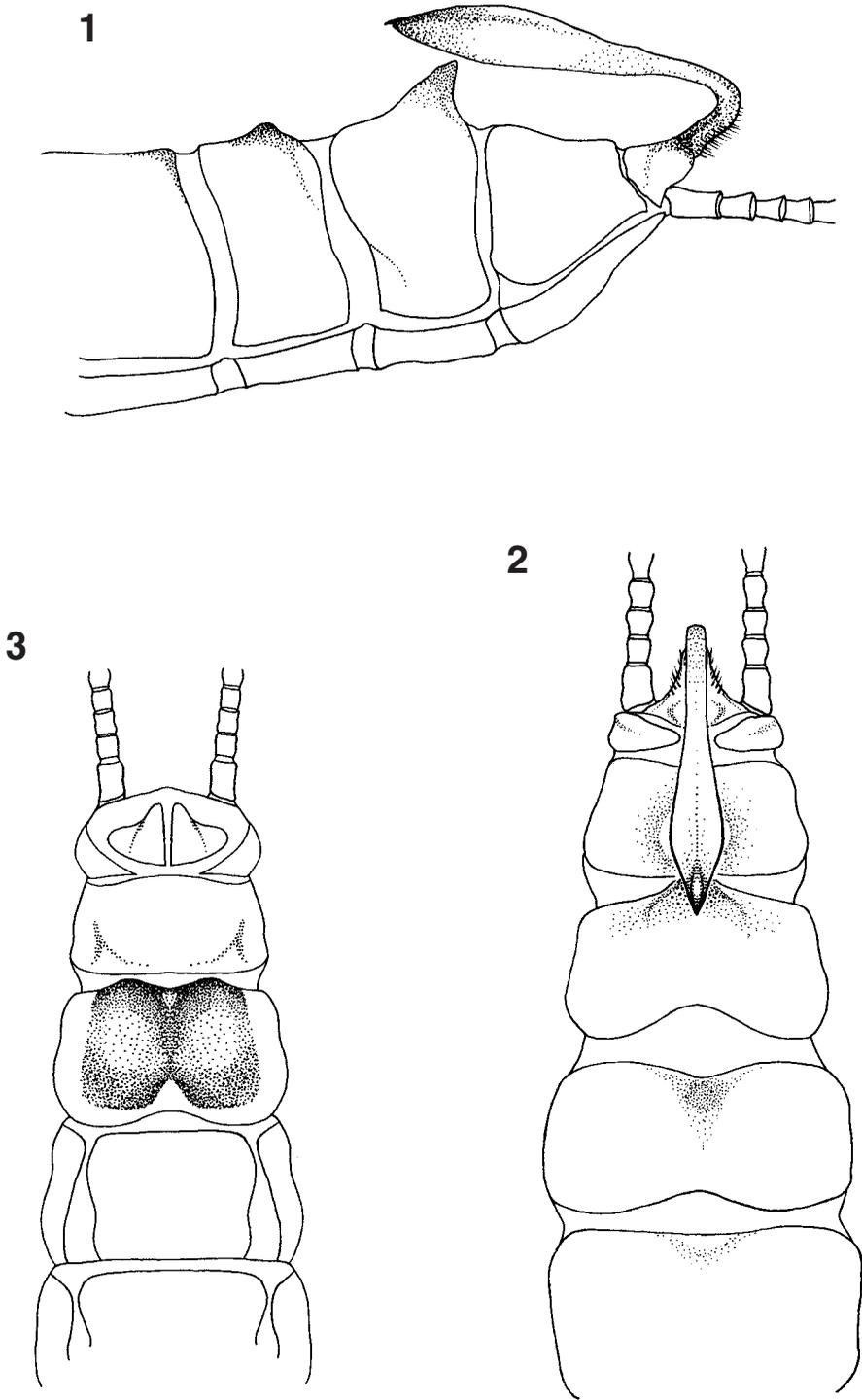
slightly fumose. Eighth abdominal tergum with small, rounded medial knob, located just before posterior margin (Figs. 1, 2). Ninth tergum bearing large, darkly sclerotized, wedge-shaped hump on posterior margin; apex wide, thin, and broadly rounded (Figs. 1, 2). Tenth tergum darkly sclerotized except for round, median, light area where epiproct rests (Fig. 2). Area under base of epiproct also light and membranous (Figs. 1, 2). Epiproct recurved, extending forward to middle of tergum 9, very narrow at base, tapering abruptly to widest expanse near apex, producing overall rounded club shape, especially in lateral view, apex pointed and bearing tiny, blunt hook (Fig. 1).

FEMALE.—Wings macropterous. Length of forewings 5.0–6.0 mm; length of body 6.0–7.0 mm. Coloration similar to male, with broad, membranous dorsal stripe extending to posterior margin of tergum 8. Subgenital plate restricted to sternum 8; entire segment darkly sclerotized; anterior margin with V-shaped indentation medially; posterior margin very darkly sclerotized, expanded into broadly rounded, bilobed margin, with median indented area (Fig. 3).

DIAGNOSIS.—*Capnia caryi* does not fit easily into any of the species groups proposed by Nelson and Baumann (1989). It is most similar to species in the Mariposa group because the large dorsal hump of the male is on tergum 9. However, even though it looks similar to *Capnia giulianii* Nelson and Baumann in lateral view, the hump is not divided in *C. caryi* as in

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Capnia caryi: Fig. 1. Adult male terminalia lateral, epiproct. Fig. 2. Adult male terminalia dorsal, epiproct. Fig. 3. Adult female terminalia ventral, subgenital plate.

all 3 species of the Mariposa group. Thus, the presence of a large, undivided hump on tergum 9 of the male, along with a small medial knob on tergum 8, serves to separate this species from all other known *Capnia* males. In addition, the female subgenital plate is distinctive in that it has a broadly rounded posterior lobe on each side of the midline. Otherwise, the presence of a large, darkly sclerotized subgenital plate could place it in any of several species groups.

TYPES.—Holotype male, allotype female, and 7 male and 3 female paratypes, NEW MEXICO, Catron Co., Upper Iron Creek, Forest Trail 151, 2650 m, 32°22.67'N, 108°34.09'W, 22 February 1999, G.Z. Jacobi and S.J. Cary. **PARATYPES:** ARIZONA, Apache Co., Mamie Creek, Forest Road 275, 2400 m, Escudilla Mountain, southeast of Springerville, 19 March 2001, G.Z. Jacobi and S.J. Cary, 2 males. Holotype and allotype deposited at the United States National Museum, Washington, D.C.; paratypes at Monte L. Bean Life Science Museum, Brigham Young University, and personal collection of G.Z. Jacobi.

ETYMOLOGY.—We are pleased to name this species after our friend and colleague Steve Cary. He was present when all type specimens were collected and has been a major participant in surveys of the stonefly fauna of New Mexico.

NOTES.—The 2 creeks in which this new species was collected are located near the border between southern Arizona and New Mexico. Iron Creek is in New Mexico and is a small tributary of the Middle Fork of the Gila River, southeast of Reserve in the Gila National Forest (Julyan 1998). Mamie Creek lies in Arizona at the base of Escudilla Peak, southeast of Springerville, and is part of the Little Colorado River drainage in the Apache National Forest. In Iron Creek, *Capnia confusa* Claassen

was emerging, and nymphs of *Skwala americana* (Klapalek), Nemouridae, and Chloroperlidae were collected. In addition to *C. caryi*, a male of *Capnia decepta* (Banks) was collected at the same time in Mamie Creek. Stream flow measurements by the New Mexico Environmental Department in 1996 showed Iron Creek to be low in flow in mid-July (0.1 m³), with a similarly estimated flow in February 1999. Surface stream flow ceased 100 m upstream of the collection location in February 1999. The substrate consisted of scattered boulders and a mixture of cobble with gravels; gradient was 3%. The water was clear (<2 NTU) and cool (<10°C), with low amounts of dissolved materials (total phosphorus <0.01 mg · L⁻¹ and total CaCO₃ alkalinity of <20 mg · L⁻¹) and low non-filterable residues (<3.0 mg · L⁻¹).

ACKNOWLEDGMENTS

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