



USGS HUC12 level with physical and climate data being used from a variety of sources at this scale. This project is generating probability of occurrence values for each HUC12 (as seen below for Illinois). The pattern of highest probability (for instance,  $\geq 0.5$ ) HUC12 occurrences will be taken as pre-European settlement range. This will be the expectation for the region. Subsets of data held in reserve are being used to test the model; we also plan to request

funding to do independent, random sampling within HUC12s to determine observed values. These will help in the generation of range loss and objective criteria for species vulnerability assessment.

Our team has also received funding from the US Fish and Wildlife Service to determine the effects of predicted climate change on the distribution of stoneflies, mayflies, and caddisflies in much of the upper Midwest, USA. We will use the climate changes predicted from several CO<sub>2</sub> emissions scenarios over the 21<sup>st</sup> century to determine how distributions may shift. The resulting information will be key to understanding climate related threats to aquatic insects and in the conservation of species and habitats.

### **Interesting Winter Emerging Stoneflies (Plecoptera: Capniidae) from Southern California**

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### **Introduction**

Southern California has been recognized as a hotspot for biodiversity (Myers et al. 2000). The region is circumscribed by high mountains of the Transverse Ranges, to the North, the San Gabriel's, to the northwest by the Santa Susana's, and to southeast by the Santa Ana's (Hogue 1974). Several streams have formed deep canyons in the San

Gabriel's and Santa Ana's, and merge into three major river systems, the Los Angeles, the San Gabriel, and Santa Ana rivers (Hogue 1974). This area is particularly attractive for collecting aquatic insects because of the geologic isolation for this region (Yerkes et al. 1965). Streams of the Transverse Ranges have retained much of their aquatic insect faunas despite heavy human pressure on these waterways flowing into a metropolitan area of over 12 million people. It has been estimated that about one-third of California's native flora and 487 native vertebrates are known to occur in this region (California Department of Fish and Game 2005). It has also been documented that endemism and diversity of invertebrates are high (Ward 2005; Bond *et al.* 2006, Vandergast et al. 2007, Baumann and Kondratieff 2011). This is apparently true for the Plecoptera, with at least five known only from in or near the Los Angeles Basin in southern California. Unique species such as *Calileuctra dobryi* Shepard and Baumann (Shepard and Baumann 1995), *Capnia coyote* Nelson and Baumann, *C. palomar* Nelson and Baumann, *C. teresa* Claassen, and *C. valhalla* Nelson and Baumann (Nelson and Baumann 1987) are apparently restricted to this region of California.

We took a collecting trip to the area from January 8-13, 2012 to obtain fresh material especially for the study of the Capniidae, both for morphological and molecular studies. We were pleased with the amount and diversity of the material we collected in the Capniidae as well as in the Nemouridae, Taeniopterygidae, and Leuctridae. We additionally collected immatures of Pteronarcyidae, Perlodidae, Chloroperlidae, and Perlidae as well.

### **Material and Methods**

Adult stoneflies were collected by searching at the water's edge and by using a beating sheet. We preserved specimens in either 80% or 100% ethanol. Additionally, nymphs were collected from selected streams and returned to Colorado State University for rearing or preserved for further study. We examined and identified our preserved material in our various laboratories using Wild M-8 and Olympus SZX12 stereomicroscopes. Specimens listed in this study are located at Brigham Young University, Provo, Utah (BYUC); Colorado State University, Fort Collins, Colorado (CSUC); The Sandberg California Stonefly Collection (SCSC); and the Hungarian National History Museum, Budapest (HMNI).

### **Results and Discussion**

A total of 2,485 specimens were collected representing at least 15 species. Several of the southern California *Capnia* endemics, *C. coyote*, *C. palomar* (Fig. 1), *C. teresa*, and *C. valhalla* (Front Cover) were collected (Table 1). At least three species of *Mesocapnia*: *M. lapwae* (Baumann & Gaufin), *M. porrecta* (Jewett) (Baumann & Gaufin 1970), and *M. sp.* We had difficulty in sorting all individuals to "species," as some individuals from several localities showed epiproct characteristics of either *M. lapwae*, *M. frisoni* (Baumann & Gaufin), or exhibited intermediate morphologies. Perhaps molecular studies using the specimens collected during this trip will help resolve these issues.

Two of the nemourid species collected, *Malenka californica* (Claassen) [as presently treated] and *Zapada cinctipes* (Banks) and the perlid *Calineuria californica* (Banks) are common widespread western North American species, whereas the

nemourids *M. biloba* (Claassen) and *Soyedina nevadensis* (Claassen) are more restricted in distribution. *Malenka biloba* (Fig. 2) is known from southern half of California and northern Baja Mexico and *S. nevadensis* from California and Nevada.

### Literature Cited

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**Table 1.** Plecoptera species collected in southern California during January 7-13, 2012. Total numbers of males (♂), females (♀), and nymphs (N) collected by all authors are presented. CRN number =C. R. Nelson field number.

CALIFORNIA: San Bernardino Co., San Gabriel Mountains, 3 miles S Cajon Junction, Swarthout Canyon Road, N 34.27484 W 117.45277, 822 m, 08-Jan-2012, CRN10099

*Capnia teresa* 1♂

*Mesocapnia lapwae* 1♂, 5♀, 2 N

*Malenka* sp. 1 N

*Taenionema* sp. 2 N

San Bernardino Co., San Gabriel Mountains, Sheep Creek, Sheep Canyon Truck Trail, 1.3 mi north of Lytle Creek, N 34.27917 W 117.49435, 1013 m, 08-Jan-2012, CRN10100.

*Mesocapnia* sp. 1 N

San Bernardino Co., San Gabriel Mountains, Lytle Creek, Applewhite Picnic Area, N 34.26011 W 117.49628, 1029 m, 08-Jan-2012, CRN10101.

*Perlomyia collaris* 3♂, 2♀

*Malenka biloba* 143♂, 119 ♀, 16 N

*Calineuria californica* 2 N

San Bernardino Co., San Gabriel Mountains, Mount Baldy Road, San Antonio Creek, at San Antonio Falls, N 34.27313 W 117.63637, 1942 m, 08-Jan-2012, CRN10102.

*Capnia gracilaria* 1 ♂

*C. palomar* 2 ♂

*C. teresa* 8 ♂, 4 ♀

*Malenka biloba* 1 ♂

*Malenka* sp 1 ♀

*Zapada cinctipes* 4 ♂, 1 ♀, 2 N

San Bernardino Co., San Gabriel Mountains, Mount Baldy Road, San Antonio Creek, 2 mi North of Mount Baldy Village, N 34.25425 W 117.64118, 1618 m, 08-Jan-2012, CRN10103

*Capnia teresa* 117 ♂ 33 ♀ 2 N

*Mesocapnia porrecta* 1 ♂ 2 ♀

*Malenka californica* 17 ♂, 6 ♀, 1 N

*Zapada cinctipes* 8 ♂, 5 ♀

*Sweltsa* sp. 1 N

*Calineuria californica* 1 N

*Isoperla* sp. 1N

San Bernardino Co., San Bernardino Mountains, Seeley Creek, Hwy 138, Camp Seeley, Crestline, tributary of Mohave River, N 34.25470 W 117.30473, 1334 m, 09-Jan-2012, CRN10105.

*Capnia coyote* 215 ♂, 42 ♀, 22 N

*Mesocapnia lapwae* 5 ♂, 5 ♀

*M. porrecta* 40 ♂, 24 ♀, 15 N

*Malenka biloba* 1 ♂, 1 ♀

*Taenionema* sp. 1 N

*Sweltsa* sp. 1 N

San Bernardino Co., San Bernardino Mountains, Sawmill Creek, crossing below Cedar Pines Park, N 34.26102 W 117.34245, 1356 m, 09-Jan-2012, CRN10106.

*Mesocapnia porrecta* 28 ♂, 29 ♀

*Paraleuctra* sp. 1 ♀

*Malenka* sp. 5 ♀

*Zapada cinctipes* 5 ♂, 2 ♀, 3 N

*Taenionema* 3 N

*Calineuria californica* 5N

San Bernardino Co., San Bernardino Mountains, East Fork of West Fork of Mohave River, Miller Canyon Road, off Hwy 138, N 34.27132 W 117.29157, 1118 m, 09-Jan-2012, CRN10107.

*Capnia coyote* 118 ♂, 32 ♀

*Mesocapnia lapwae* 9 ♂, 13 ♀, 9 N

San Bernardino Co. San Bernardino Mountains, unnamed tributary of East Fork of West Fork of Mohave River, Hwy 138 N 34.26507 W 117.28699, 1191 m, 09-Jan-2012, CRN10108.

*Capnia coyote* 7 ♂, 4 ♀

*Mesocapnia lapwae* 57 ♂, 55 ♀

*M. porrecta* 10 ♂, 4 ♀

San Bernardino Co. San Bernardino Mountains, Snow Fork, Hwy 18, 3 miles west of Big Bear Lake, N 34.24503 W 117.02787, 2185 m, 09-Jan-2012, CRN10109.

*Capnia palomar* 1 ♂

*C. teresa* 1 ♂

*Malenka* sp. 1 ♀

*Soyedina nevadensis* 1 ♂, 3 N

*Zapada cinctipes* 2♀, 1 N

San Bernardino Co., San Bernardino Mountains, Santa Ana River, Hwy 38, jct Wildhorse Creek, N 34.16837 W 116.81517, 1954 m, 09-Jan-2012, CRN10111.

*Capnia teresa* 9♂, 3♀

*Zapada cinctipes* 1♂, 3♀

San Bernardino Co., San Bernardino Mountains, Santa Ana River, Seven Oaks Road bridge, N 34.18610 W 116.91906, 1591 m, 09-Jan-2012, CRN10112.

*Capnia teresa* 246♂, 56♀

*Zapada cinctipes* 3♂, 3♀

CALIFORNIA: Riverside Co., San Jacinto Mountains, Fuller Mill Creek, Hwy 243, Fuller Mill Creek Picnic Area, N 33.79893 W 116.74905, 1561 m, 10-Jan-2012, CRN10113.

*Capnia palomar* 3♂

*C. teresa* 37♂, 23♀, 2 N

*Mesocapnia lapwae* 1♂

*M. sp.* 2♂

*Malenka californica* 2♀

*Zapada cinctipes* 8♂, 4♀, 1 N

*Sweltsa sp.* 1 N

*Calineuria californica* 1 N

Riverside Co., San Jacinto Mountains, Tahquitz Creek, Humber Park above Idyllwild, N 33.76439 W 116.68756, 1963 m, 10-Jan-2012, CRN10114.

*Zapada cinctipes* 1♀

Riverside Co., San Jacinto Mountains, Coldwater Creek Canyon Trail, above Keenwild Ranger Station, off Hwy 243, N 33.70570 W 116.71574, 1416 m, 10-Jan-2012, CRN10115.

*Mesocapnia lapwae* 5♂, 5♀, 11 N

*Taenionema sp.* 1 N

Riverside Co., San Jacinto Mountains, Hurkey Creek, Hwy 74, Hurkey Creek Campground, N 33.67990 W 116.68121, 1380 m, 10-Jan-2012, CRN10116.

*Mesocapnia lapwae* 19♂, 20♀

*Taenionema sp.* 4 N

Riverside Co., San Jacinto Mountains, Strawberry Creek, Hwy 74, ca. 3 miles west of Mountain Center, N 33.71085 W 116.76941 882 m 10-Jan-2012, CRN10118.

*Capnia teresa* 6♂, 2♀

*Mesocapnia lapwae* 9♂, 17♀, 4 N

*Malenka sp.* 1♀, 1 N

*Zapada cinctipes* 3 N

*Taenionema sp.* 27 N

CALIFORNIA: San Diego Co., Palomar Mountain, Fry Creek, Fry Creek Campground, Road S-6, N 33.34466 W 116.88013, 1462 m, 11-Jan-2012, CRN10119.

*Capnia coyote* 1♂

*C. palomar* 19♂, 1♀

*C. valhalla* 2♂

*Mesocapnia lapwae* 6♂, 6♀

*M. porrecta* 11♂

*M. sp.* 21♂, 15♀, 3 N

*Malenka biloba* 17♂, 7♀, 1 N

*Zapada cinctipes* 1♂

*Sweltsa sp.* 2 N

San Diego Co., Palomar Mountain, Iron Springs Creek, Road S-6, N 33.33277 W 116.87142, 1467 m, 11-Jan-2012, CRN10120.

*Capnia palomar* 1♂

*C. teresa* 3♂

*Mesocapnia porrecta* 12♂, 14♀

*Malenka biloba* 3♂, 2♀

*M. californica* 14♂, 16♀

*Zapada cinctipes* 5♂, 7♀

CALIFORNIA: Orange Co., Santa Ana Mountains, Trabuco Creek, Trabuco Canyon at point of narrowing, N 33.67360 W 117.54151, 419 m, 11-Jan-2012, CRN10123.

*Mesocapnia lapwae* 10♂ 8♀, 5 N

*Malenka biloba* 1♂ 2♀, 5 N

*Calineuria californica* 3 N

*Taenionema* sp. 1 N

CALIFORNIA: Los Angeles Co. San Gabriel Mountains, Placerita Creek, East of I-5, Waterfall Trail, Placerita Canyon County Park, N 34.36963 W 118.44392, 613 m, 12-Jan-2012, CRN10125.

*Mesocapnia lapwae* 25♂, 14♀, 26 N

*Malenka biloba* 2♂, 4♀, 1 N

Los Angeles Co., San Gabriel Mountains, Arroyo Seco Creek, Switzer Campground, Hwy 2, N 34.26586 W 118.14425, 1001 m, 12-Jan-2012, CRN10126.

*Capnia gracilaria* 12♂, 3♀, 1 N

*Mesocapnia lapwae* 50♂, 52♀, 5 N

*Malenka biloba* 24♂, 25♀, 3 N

Los Angeles Co., San Gabriel Mountains, small stream, Hwy 2, 1.5 air miles East of Switzer Campground, N 34.26829 W 118.11785, 1280 m, 12-Jan-2012, CRN10127.

*Mesocapnia lapwae* 1♂ 3♀

*Taenionema* sp. 2 N

Los Angeles Co. San Gabriel Mountains, Soldier Creek, Soldier Creek Trail, below Crystal Lake Campground, N 34.32034 W 117.83323 1637 m, 13-Jan-2012, CRN10131.

*Mesocapnia porrecta* 1♂, 3♀

*Malenka biloba* 1♂, 1♀, 1 N

*M. californica* 3♂, 5♀

*Soyedina* sp. 1♀, 2 N

*Zapada cinctipes* 3♂, 3♀

*Calineuria californica* 7 N

Los Angeles Co. ,San Gabriel Mountains, Soldier Creek, below Crystal Lake Recreation Area, Crystal Lake Road, 7 road miles North of Coldbrook Campground, N 34.31779 W 117.83659, 1614 m, 13-Jan-2012, CRN10132.

*Mesocapnia porrecta* 2♂, 1♀

*Malenka biloba* 1♂

*M. californica* 4♂, 4♀

*Soyedina nevadensis* 2♂, 2♀

*Zapada cinctipes* 3♂, 3♀

Los Angeles Co., San Gabriel Mountains, Soldier Creek at Falling Springs, 2.3 road miles North of Coldbrook Campground, Hwy 39, N 34.30136 W 117.83829, 1177 m, 13-Jan-2012, CRN10134.

*Capnia teresa* 1♂

*Malenka biloba* 5♂, 3♀

*M. californica* 12♂ 13♀

*Soyedina* sp. 1 N  
*Zapada cinctipes* 16♂, 9♀  
*Calineuria californica* 2 N  
*Isoperla* sp. 2 N

Los Angeles Co., San Gabriel Mountains, Soldier Creek, Coldbrook Campground, Hwy 39 N 34.29393 W  
117.83950, 1024 m, 13-Jan-2012, CRN10135.

*Capnia teresa* 1♀  
*Mesocapnia porrecta* 14♂, 9♀  
*Malenka biloba* 3♂, 4 ♀  
*Malenka californica* 1♂, 6♀  
*Zapada cinctipes* 2♀  
*Calineuria californica* 2 N

Los Angeles Co., San Gabriel Mountains, Coldbrook Creek, Coldbrook Campground, Hwy 39 N 34.29393  
W 117.83950, 1024 m, 13-Jan-2012, CRN10136.

*Capnia teresa* 1♂  
*Mesocapnia porrecta* 9♂, 10♀  
*Malenka biloba* 2♂



Figure 1. *Capnia palomar* ♂. California: San Diego Co., Palomar Mountain, Fry Creek,



Figure 2. *Malenka biloba*. California: Los Angeles Co., San Gabriel Mountains, Arroyo Seco Creek, Switzer Campground, Hwy 2.

## OTHER MEETINGS

**The 1st Annual World Congress of Biodiversity-2012 (WCBD-2012)** will be held April 25-28, 2012, in Xi'an, China.

**The 3rd International Forum for Surveillance and Control of Mosquitoes and Mosquito-borne Diseases** will be held at Suzhou, Jiangsu, China, May 27-31, 2013. Contact Dr. Rudy Xue at [xueamcd@yahoo.com](mailto:xueamcd@yahoo.com) and Dr. Tongyan Zhao at [aedes@263.net](mailto:aedes@263.net)

**The International Congress of Entomology** will be held August 19-25, 2012 in Daegu, South Korea.

**Entomology 2012, the 60th Annual Meeting of the Entomological Society of America**, will be held November 11-14, 2012 in Knoxville, Tennessee.

**RECENT PLECOPTERA LITERATURE (CALENDAR YEAR 2011 AND EARLIER)**. Papers made available after 1 February 2012 will be included in the next issue. **If papers were missed, please bring these to the attention of the Managing Editor.** Drs. J. Manuel Tierno de Figueroa and Peter Zwick are thanked for reviewing and providing additions to this present list.

Aagaard, K. and T. Bongard. 2011. Disentangling the effects of heterogeneity, stochastic dynamics and sampling in a community of aquatic insects. *Ecological Modelling* 222: 1387-1393.

Al-Shami S. A., C. S. Md Rawi, A. H. Ahmad, S. A. Hamid, and S. A. M. Nor. 2011. Influence of agricultural, industrial, and anthropogenic stresses on the distribution and



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