Stark, B.P. & R.W. Baumann 2006. The Female and Egg of *Salmoperla sylvanica* (Plecoptera: Perlodidae). *Illiesia*, 2(3):24 -26. Available online: http://www2.pms-lj.si/illiesia/Illiesia02-03.pdf

THE FEMALE AND EGG OF *SALMOPERLA SYLVANICA* (PLECOPTERA: PERLODIDAE)

Bill P. Stark[1] & Richard W. Baumann[2]

[1]Box 4045, Department of Biology, Mississippi College, Clinton, Mississippi, 39058 U.S.A.
E-mail: stark@mc.edu
[2]Department of Integrative Biology and Monte L. Bean Life Science Museum, Brigham Young University, Provo, Utah, U.S.A. 84602
E-mail: richard_baumann@byu.edu

ABSTRACT
The first descriptions of the egg and female are provided for *Salmoperla sylvanica* Baumann & Lauck, a large perlodine stonefly known only from northern California. Comparisons are made with *Oroperla*, the apparent sister group for *Salmoperla.*

Keywords: Plecoptera, Perlodidae, *Salmoperla sylvanica*, female and egg descriptions

INTRODUCTION

Salmoperla sylvanica was proposed as a new genus and species by Baumann & Lauck (1987) from two males and 33 nymphs collected mostly in small tributaries of Willow Creek in the greater Trinity-Klamath River drainage, Humboldt Co., California (Baumann & Lauck, 1987; Nelson & Stark, 1987). Although we and various colleagues have continued to collect in this area, we are aware of only one additional field collected adult, a male, collected by our field group in 1991. However, a sample of eggs was obtained from a pre-emergent nymph we collected in 1987, and the first known female was reared by a colleague, J. Lee, in 1991. This female is somewhat teneral and has slightly crumpled wings but the eggs are mature and the subgenital plate is fully formed, consequently we provide the following descriptions of female genitalia and eggs in order to aid in recognition of this uncommon species. We also take this opportunity to report the first collections of this species by a colleague, W.D. Shepard, made considerably south of the Humboldt Co. sites in Colusa Co., from well outside the drainage of the Trinity and Klamath Rivers. Specimens used in this study are deposited in the Monte L. Bean Life Science Museum, Brigham Young University, Provo (BYUC), the California Academy of Sciences, San Francisco (CASC) and the B.P. Stark Collection, Mississippi College, Clinton (BPSC).

Salmoperla sylvanica Baumann & Lauck

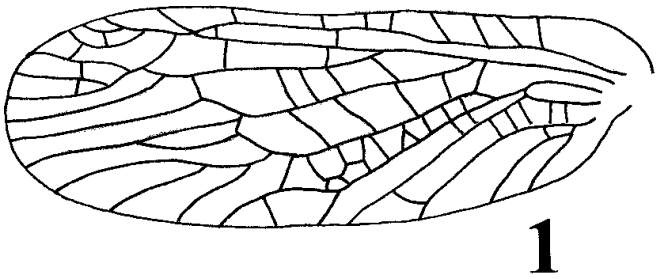
(Figs. 1-6)

Salmoperla sylvanica Baumann & Lauck, 1987: 827. Description of male and nymph.

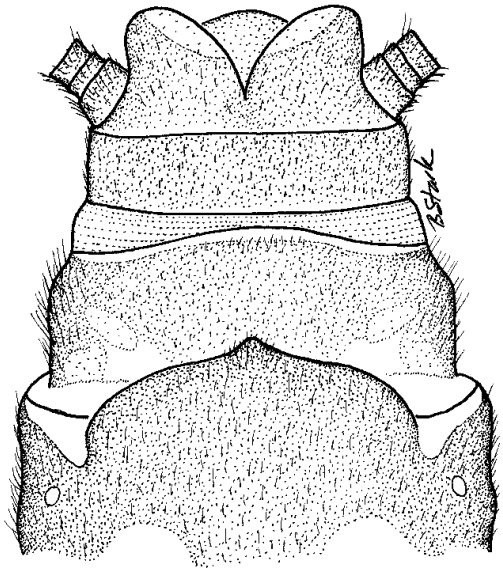
Salmoperla: Stewart & Stark, 1988:408. Re-description of nymph.

Material examined. CALIFORNIA: Humboldt Co.: East Willow Creek drainage, 10 April, 1991, J. Lee, 1 ♀ (reared, emerged 26 June), 2 nymphs (BYUC). Small stream 0.5 miles E Cedar Creek, Hwy. 299, 25 April 1987, B. Stark, R.W. Baumann, C.R. Nelson, S. Wells, 2 nymphs (with eggs)(BPSC). Slide Creek, Hwy 13, south of Fish Lake Campground, 31 May 1991, R.W. Baumann, B. Stark, C. Henderson, 1 ♂ (BYUC). Red Mountain Creek, road to Fish Lake, 19 April 1980, J. Lee, 1 nymph (BYUC). Colusa Co.: Little Stony Creek, 10 miles SW Stonyford, 13 February 1988, W.D. Shepard, 1 nymph (CASC).

Female. Brachypterous. Forewing length 16.5 mm. Venation as in Fig. 1. General color and gill formula as in male. Subgenital plate broadly triangular and



1



2

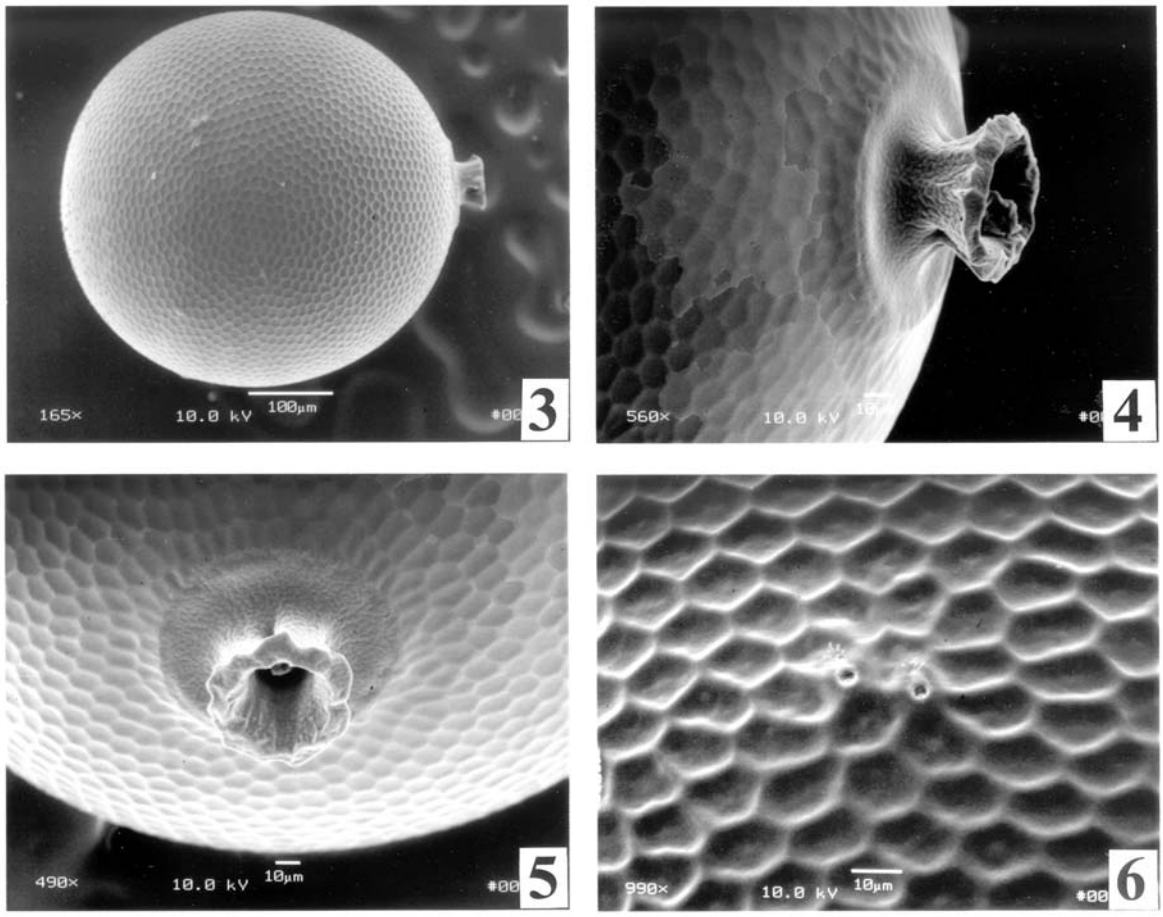
Figs. 1-2. *Salmoperla sylvanica* female. 1. Forewing. 2. Abdominal sterna 8-10.

somewhat nipple-like at tip; apex projects over basal third of sternum 9 (Fig. 2). Sternum 9 clothed with sparse, fine setae; intersegmental membrane posterior to sternum 9 armed with dense, broad microtrichia patch (Fig. 2).

Egg. Outline, excluding collar, almost spherical to oval. Length (without collar) about 0.45-0.53 mm; diameter about 0.44-0.45 mm (Fig. 3). Collar short (ca. 0.053 mm), narrow (ca. 0.059 mm at midlength), prominently ribbed, slightly flanged around rim, and with an irregularly granular texture (Figs. 3-5); base of collar surrounded by low ridge. Chorion covered throughout with uniformly sized follicle cell impressions (width ca. 0.015 mm); FCI's with thin low walls and concave impuncate floors (Figs. 5-6). Micropyles set on low turrets (Fig. 6).

DISCUSSION

Female *Salmoperla* are easily distinguished from most other stonefly genera by the presence of double gill remnants on the meso and metathorax, a feature shared only with *Oroperla* among American genera. *Oroperla* adults retain the distinctive paired abdominal gills permitting easy separation of these two genera, and the subgenital plate of *Oroperla* is also much longer and bilobed rather than short and entire. The egg collar is also quite similar for these genera but follicle cell impressions for *Salmoperla* have thin walls, whereas those for *Oroperla* are quite thick (Stark & Szczytko, 1988).



Figs. 3-6. *Salmoperla sylvanica* egg. 3. Entire egg. 4. Collar, lateral aspect. 5. Collar, polar aspect. 6. Micropyles and chorionic detail.

The egg and female genitalic characters revealed in this study do little to resolve the placement of *Salmoperla* in any phylogenetic treatment for Arcynopterygini, however the double gill structures for the 2nd and 3rd thoracic segments are shared only with the Asian genus *Sopkalia*, in addition to *Oroperla.* Because the former genus shares additional derived features with *Megarcys* (Stark & Szczytko, 1988) it seems possible that the presence of this gill feature in *Sopkalia* might represent a convergence.

ACKNOWLEDGMENTS

We thank Jonathan Lee and William D. Shepard for providing specimens and sharing collection information. We also thank Vince Lee for arranging the loan of material from the California Academy of Sciences.

REFERENCES

Baumann, R.W. & D. R. Lauck. 1987. *Salmoperla*, a new stonefly genus from northern California (Plecoptera: Perlodidae). Proceedings of the Entomological Society of Washington 89:825-830.

Nelson, C.R. & B.P. Stark. 1987. The *Salmoperla* safari: Hit and run stonefly collecting in Nevada and California. Perla 8:7-11.

Stark, B.P. & S.W. Szczytko. 1988. Egg morphology and phylogeny in Arcynopterygini (Plecoptera: Perlodidae). Journal of the Kansas Entomological Society 61:143-160.

Stewart, K.W. & B.P. Stark. 1988. Nymphs of North American stonefly genera (Plecoptera). Thomas Say Foundation Series, Entomological Society of America 12:1-460.

Received 9 March 2006, Accepted 17 March 2006, Published 11 April 2006