



A NEW SPECIES OF THE WESTERN NORTH AMERICAN GENUS *TRIZNAKA* FROM OREGON (PLECOPTERA: CHLOROPERLIDAE)

Boris C. Kondratieff¹ & Richard W. Baumann²

¹Department of Bioagricultural Sciences and Pest Management,
Colorado State University, Fort Collins, Colorado, U.S.A. 80523
E-mail: Boris.Kondratieff@Colostate.edu

²Department of Biology and Monte L. Bean Life Science Museum,
Brigham Young University, Provo, UT, U.S.A. 84602
E-mail: richard_baumann@byu.edu

ABSTRACT

A new species of Chloroperlidae in the genus *Triznaka*, *T. wallowa*, is described from Union Co., Oregon, U.S.A. Distinguishing characters and a key to the North American species are given.

Keywords: Plecoptera, stonefly, *Triznaka*, new species, Oregon, U.S.A.

INTRODUCTION

Baumann and Kondratieff (2008) provided a recent review of the genus *Triznaka* in North America, recognizing three species: *T. pintada* (Ricker, 1952); *T. sheldoni* Baumann & Kondratieff, 2008; and *T. signata* (Banks, 1895). Recently, Cary Kerst of Eugene, Oregon, made his collection of stoneflies from Fry Meadow Creek in Union County available to us, and to the authors' surprise, a new species of *Triznaka* was included. Upon request, Nadine Craft of La Grande, Oregon, made a second collection of adults of this species from the same stream later in July. The holotype is deposited at the United States National Museum (USNM) and paratypes are in the R.W. Baumann Stonefly Collection, Brigham Young University (BYUC) and the C.P. Gillette Museum of Arthropod Diversity, Colorado State University (CSUC).

RESULTS AND DISCUSSION

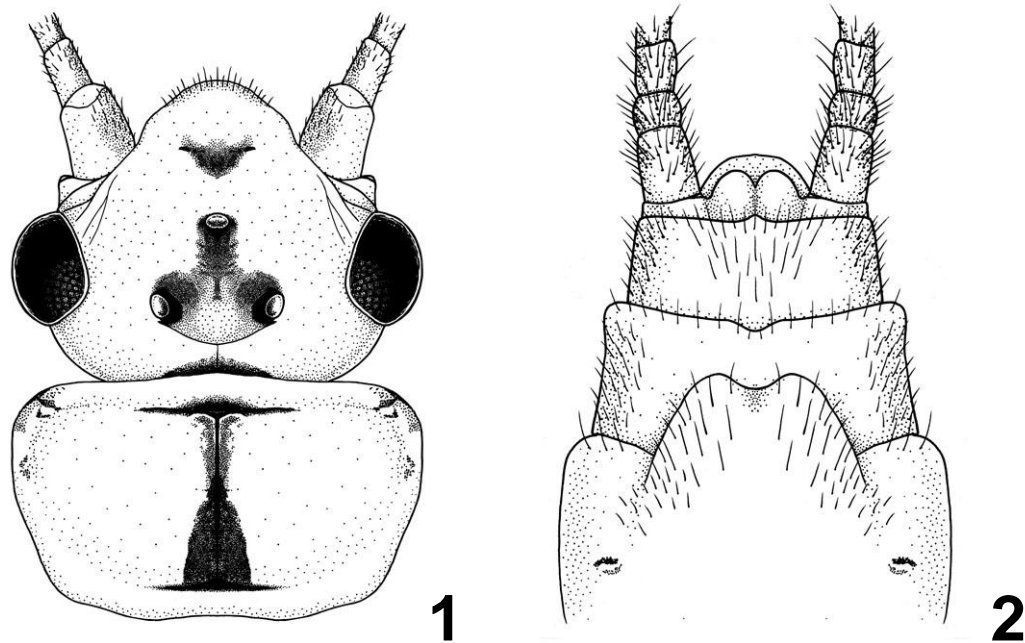
Triznaka wallowa sp. n.
(Figs. 1-12)

Material examined. Holotype ♂, USA, Oregon, Union County, Fry Meadow Creek, Forest Road 62, above confluence Grand Ronde River, near junction of Wallowa River, 2 July 2011, C. Kerst (USNM). Paratypes (BYUC, CSUC): Same locality as holotype: 2 July 2011, C. Kerst, 4♂, 3♀; 23 July 2011, N. M. Craft, 8♂, 6♀.

Male. Macropterous. Length of forewing 9-11 mm. General color yellow, to light yellow-brown. Head and pronotum with black markings, median pronotal stripe expanded anteriorly and especially posteriorly, with rugosities unmarked (Fig. 1); abdomen with mid-dorsal black stripe, extending

from segments 1-8. Hammer present on sternum 7 (Fig. 9). Epiproct widest at base (Fig. 7), rugose at tip, bearing basally expanded scale-like spines ante-apical to tip and on lateral edges, also bearing medial and basal setae (Figs. 7, 8). Aedeagus,

ventrally with a distinct median band of thick reddish-brown setae arranged in longitudinal rows (Figs. 3, 4, 5, 6, 11, 12), aedeagal apex with a pair of triangular lobes, surrounded by patches of setae (Figs. 3, 4).



Figures 1-2. *Triznaka wallowa*, Fry Meadow Creek, Oregon. 1. Head and pronotum. 2. Female, terminalia, ventral.

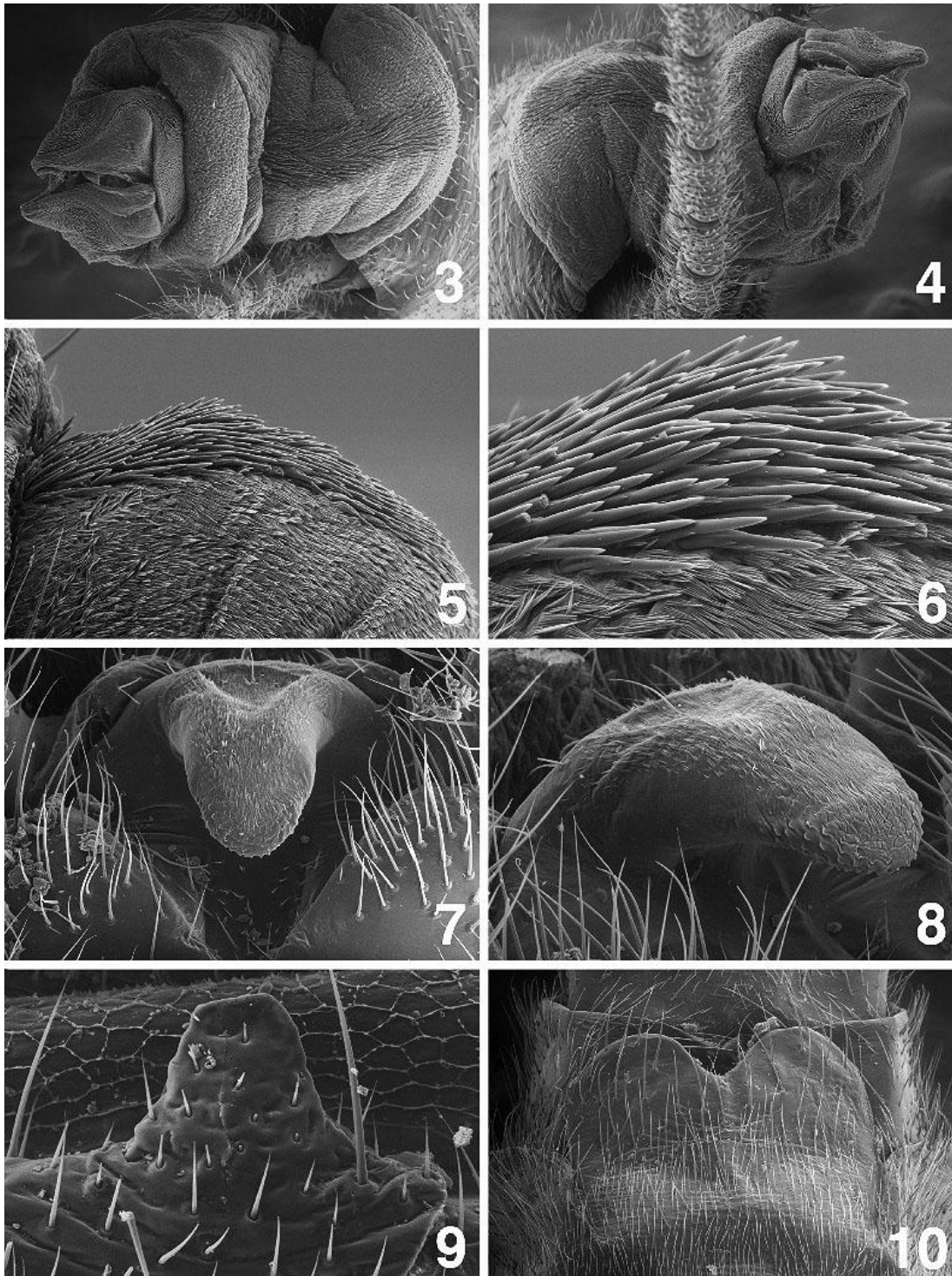
Female. Length of forewing 10-11 mm. Coloration and markings similar to male, black pronotal stripe often wider. Subgenital plate often narrow at apex, lateral margins relatively straight to slightly convex, apical margin shallowly emarginate (Fig. 2) to relatively deeply emarginate (Fig. 10).

Larva. Unknown.

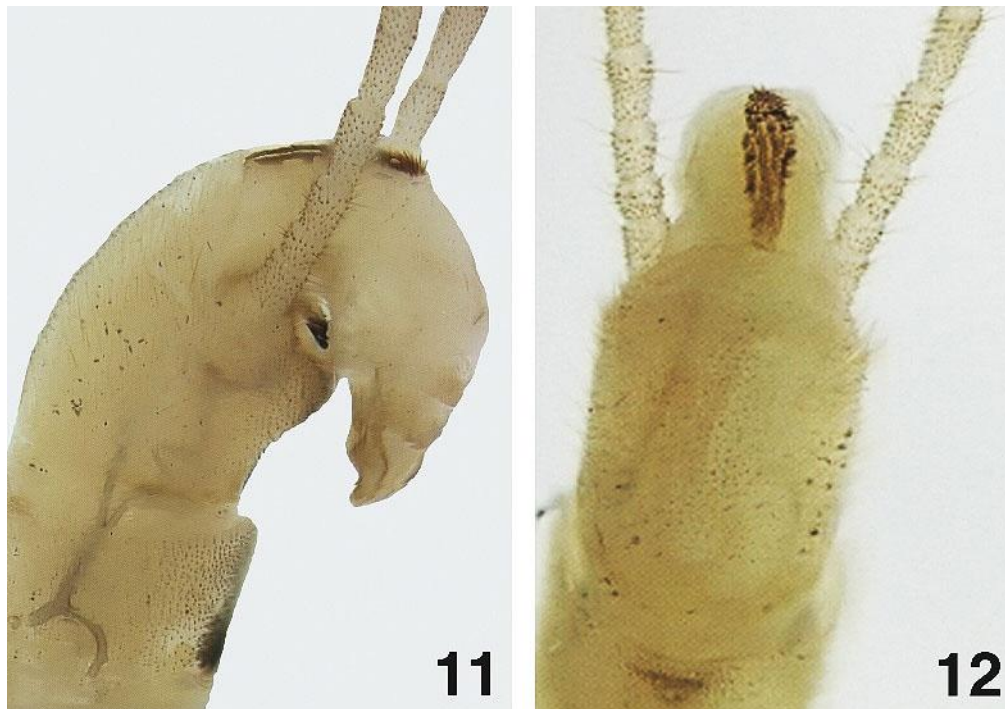
Etymology. The species name is a noun in apposition based on the Wallowa Mountains of northeastern Oregon.

Diagnosis. The males of *T. wallowa* can be readily separated from the other three described *Triznaka* species by the distinctive ventral longitudinal band of reddish-brown setae on the aedeagus (Figs. 3, 4, 5, 6, 11, 12). The aedeagus of *T. signata* has a ventral broad mushroom shaped patch of golden setae

(Baumann and Kondratieff 2008, figs. 15-17, 23, 24, 31). The aedeagus of *T. pintada* bears numerous large basal spines and an inverse V-shaped medial patch of golden setae (Baumann and Kondratieff 2008, figs. 12-14, 29). The basal half of the aedeagus of *T. sheldoni* in ventral aspect is covered with hair-like setae and a medial elongate patch of spines (Baumann and Kondratieff 2008, figs. 18-20, 33). The epiproct tips of the four species are similar, with flattened setae basally, and overlapping scales of spine-like setae apically as shown for *T. wallowa* (Figs. 7, 8). The subgenital plate of *T. wallowa* is narrower at the apex (Figs. 2, 10) than either *T. sheldoni* (Baumann and Kondratieff 2008, figs. 42-44) or *T. pintada* (Baumann and Kondratieff 2008, figs. 37-39), which can also have emarginated apical margins.



Figures 3-10. *Triznaka wallowa*, Fry Meadow Creek, Oregon. 3. Male, aedeagus, ventral. 4. Male, aedeagus, lateral. 5. Male, aedeagus, ventral spine patch. 6. Male, aedeagus, ventral spine patch, magnified. 7. Male, epiproct, dorsal. 8. Male, epiproct, dorsolateral. 9. Male, sternum 7, hammer. 10. Female, subgenital plate, ventral.



Figures 11-12. *Triznaka wallowa*, Fry Meadow Creek, Oregon. 11. Male, terminalia and aedeagus, lateral. 12. Male, aedeagus, ventral.

Key to the species of *Triznaka*

- | | | | |
|----|---|--|-------------------|
| 1 | Male: Epiproct present (Figs. 7, 8) | 2 | |
| 1' | Female: Subgenital plate present (Figs. 2, 10) ... | 5 | |
| 2 | Aedeagus with numerous large dark ventral spines at base (Baumann and Kondratieff 2008, figs. 12-14, 22, 29); pronotal rugosities strongly marked with black | <i>T. pintada</i> | |
| 2' | Aedeagus lacking large dark ventral spines at base, rugosities unmarked or lightly marked in black | 3 | |
| 3 | In ventral view, aedeagus with a distinct longitudinal band of reddish-brown setae (Figs. 3-6, 11, 12) | <i>T. wallowa</i> | |
| 3' | In ventral view, aedeagus lacking a distinct longitudinal band of reddish-brown setae | 4 | |
| 4 | In ventral view, aedeagus midlength with a broad mushroom- shaped patch of long, golden hairs (Baumann and Kondratieff 2008, figs. 15-17, 23, 24, 31); aedeagus ringed with a subapical band of raised reticulations (Baumann and Kondratieff | 2008, figs. 15-17, 23, 24, 31); median pronotal stripe wide in entire length | <i>T. signata</i> |
| 4' | In ventral view, basal half of aedeagus sparsely covered with thin hair-like setae (Baumann and Kondratieff 2008, figs. 18-20), medially with an irregular elongate patch of thin spines (Baumann and Kondratieff 2008, figs. 20, 33); subapically beyond median lobe, spines comb-like, triangular process ventrally at apex (Baumann and Kondratieff 2008, figs. 34-36); pronotal stripe narrow, wider anteriorly and posteriorly | <i>T. sheldoni</i> | |
| 5 | Apical margin of subgenital plate rounded (Baumann and Kondratieff 2008, figs. 40, 41); median pronotal stripe uniformly wide in entire length | <i>T. signata</i> | |
| 5' | Apical margin of subgenital plate truncate or notched (Baumann and Kondratieff 2008, figs. 38, 42-44) (Figs. 2, 10); median pronotal stripe not of uniform width | 6 | |
| 6 | Apical margin of subgenital plate truncate entire | | |

- | | |
|---|--|
| <p>to slightly emarginate (Baumann and Kondratieff 2008), figs. 37-39); pronotal rugosities strongly marked with black <i>T. pintada</i></p> <p>6' Apical margin of subgenital plate usually deeply emarginate to notched (Baumann and Kondratieff 2008, figs. 42, 43) (Figs. 2, 10); pronotal stripe wider</p> | <p>anteriorly and posteriorly (Fig. 1); rugosities unmarked or lightly marked with black 7</p> <p>7 Subgenital plate broad at apex (Baumann and Kondratieff 2008, figs. 42, 44) <i>T. sheldoni</i></p> <p>7' Subgenital plate narrowed at apex (Figs. 2, 10) <i>T. wallowa</i></p> |
|---|--|



Figs. 13-14. Fry Meadow Creek, Forest Road 62, Union County, Oregon. 13. Upstream view, wet, 23 July 2011, Nadine Craft. 14. Downstream view, dry, 15 August 2011, Cary Kerst.

REMARKS. Fry Meadow Creek was flowing on July 2 and 23 (Fig. 13) when both adult collections were made, but when Cary Kerst returned to the site on 15 August, the stream was dry (Fig. 14). The Wallowa Mountains are located in the Columbia Plateau of northeastern Oregon, an area often known as the “Alps” of Oregon. Most precipitation in the Wallowa Mountains occurs in the form of snow during the colder months and in the higher elevations, and usually from late July to mid-December there is little additional precipitation (Hamlet et al. 2005). Drying of streams such as Fry Meadow Creek may also result from decreased snowpack and earlier runoff that this region has recently experienced (Luce and Holden 2009). The Wallowa Mountains are relatively isolated from the Rocky Mountains to the east and the Cascade Range to the west. However, the stonefly fauna of these mountains is most closely related to the Rocky Mountains (Baumann et al. 1977). The Quaternary climate fluctuations and topographical variation of the region, including the Wallowa Mountains, may have isolated a clade that gave rise to *T. wallowa* as has been reported for other faunal elements (Chavez and Kenagy 2010). Additional adult stoneflies collected by Nadine Craft with *T. wallowa* included *Podmosta decepta* (Frison) and *Suwallia* sp.

ACKNOWLEDGEMENTS

Special thanks are given to Cary Kerst, Eugene, Oregon who first collected this interesting species and made his collections available to us. We appreciate Nadine Craft, Fisheries Biologist, Oregon Department of Fish and Wildlife, La Grande, Oregon who subsequently visited Fry Meadow Creek and added to the type series. Vincent Lee, California Academy of Sciences, San Francisco, California and Oliver Flint, Jr. United States National Museum, Washington, D. C. assisted us to borrow *Triznaka* specimens from Oregon for comparison. Thanks are given to Michael Standing, Brigham Young University, Electron Microscope Laboratory, who aided in the production of the electron micrographs with a Philips XL30 ESEM FEG. Luis Belo and Shawn Clark, Brigham Young University made the color photographs of the male terminalia with an Olympus SZX12 stereo microscope using Micro Suite software and a MTI 3CCD camera. Lori Discoe, Fort Collins,

Colorado, produced the line illustrations. The final figure plates were constructed by Randy Baker, graphic artist at the Monte L. Bean Life Science Museum, Brigham Young University. Photographs of Fry Creek on 23 July 2011 were made by Nadine Craft and the photograph of the dry stream was made by Cary Kerst on 15 August 2011.

REFERENCES

- Banks, N. 1895. New neuropteroid insects. Transactions of the American Entomological Society, 22:313-316.
- Baumann, R.W. and B.C. Kondratieff. 2008. A review of the western North American genus *Triznaka* (Plecoptera: Chloroperlidae) with a new species from the Great Basin, U.S.A. Proceedings of the Entomological Society of Washington, 110:345-362.
- Baumann, R.W., A.R. Gaufin, and R.F. Surdick. 1977. The stoneflies (Plecoptera) of the Rocky Mountains. Memoirs of the American Entomological Society, 31:1-208.
- Chavez, A.S. and G.J. Kenagy. 2010. Historical biogeography of western heather voles (*Phenacomys intermedius*) in montane systems of the Pacific Northwest. Journal of Mammalogy, 91:874-885.
- Hamlet, A.F., P.W. Mote, M.P. Clark, and D.P. Lettenmaier. 2005. Effects of temperature and precipitation variability on snowpack trends in the Western United States. Journal of Climate, 18:4545-4561.
- Luce, C.H. and Z.A. Holden. 2009. Declining annual streamflow distributions in the Pacific Northwest. Geophysical Research Letters, 36:L16401.
- Ricker, W.E. 1952. Systematic studies in Plecoptera. Indiana University Publications in Science, Series 18, 200 pp.

Received 9 February 2012, Accepted 20 February 2012, Published 23 February 2012