

**NEW SPECIES OF *PARALEPTOPHLEBIA*
(EPHEMEROPTERA: LEPTOPHLEBIIDAE)
FROM IDAHO AND WASHINGTON¹**

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ABSTRACT: *Paraleptophlebia jenseni*, n. sp., is described from male adults from Klickitat County, Washington. The species has also been collected from Owyhee County, Idaho, and is most closely related to *P. traverae*, n. sp., which is based on the male adult from Idaho County, Idaho, previously misidentified as *P. rufivenosa*. Forewing pigmentation and morphology of the penes are diagnostic of the new species.

A much-used aid to the identification and study of mayflies of northwestern North America has been the unpublished Masters thesis on the mayflies of Idaho by S. L. Jensen (1966). Besides providing invaluable keys and figures therein, Jensen proposed several new taxa from Idaho, including a species of *Paraleptophlebia* Lestage. Jensen (1966) ostensibly determined that the new *Paraleptophlebia* species, which he knew only as male adults from Owyhee County, was similar to *P. rufivenosa* Eaton, a species known from Oregon [lectotype locality (Spieth 1941)], Washington, and California (Eaton 1884); British Columbia (McDunnough 1924); and questionably Idaho (Traver 1935). Although *P. rufivenosa* was described from female adults and female subimagos, a single male adult from Idaho was assigned to the species by Traver (1935). Female adults of *Paraleptophlebia* exhibit few reliable specific characteristics and have not been treated comparatively (Traver 1935, Harper and Harper 1986). Thus, Traver's (1935) male adult has formed the essential basis of the taxonomic concept of *P. rufivenosa* (Spieth 1941, McCafferty 1996) and was used for comparison by Jensen (1966), although he had not examined Traver's specimens.

George Edmunds (who served as Jensen's advisor at the University of Utah during the Idaho study) recently requested that WPM publish a formal description of the new species, but unfortunately none of Jensen's material of the new species could be located, and such a description could not proceed. More recently, Robert L. Newell of Richland, Washington collected a series of an unknown *Paraleptophlebia* species from Klickitat County, Washington, and kindly made the material available to BCK. Characteristics of the male adult specimens from Washington are consistent with Jensen's unpublished description of a new species from Idaho. We are pleased at long last to be able to describe this species as *P. jenseni*, n. sp., after Steve Jensen.

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We have also compared the new species to the male that Traver (1935) assigned to *P. rufivenosa*. Traver never indicated the basis of assigning her male specimen from Grangeville, Idaho to *P. rufivenosa*. In fact, "Paraleptophlebia rufivenosa?" is the way that Traver labeled the actual preserved specimen. Her assignment of the specimen to *P. rufivenosa* appears to have been based on speculation because the male genitalia were different from those of any other species known at the time. Certainly the general dark coloration of the body found in Traver's specimen is typical of several species of *Paraleptophlebia* and of little use in associating sexes. Significantly, Traver's male is devoid of any membrane staining in the forewings, whereas Eaton indicated that forewings of the female adults of *P. rufivenosa* were uniformly and lightly tinted. This along with any definitive evidence to link the putatively identified specimen to *P. rufivenosa* leads us to conclude that Traver's male is not *P. rufivenosa*. Below, we consider it as a new species and name it in memoriam to Jay Traver, as *P. traverae*, n. sp.

Eaton (1884) described *Paraleptophlebia vaciva* (Eaton) from Mount Hood, Oregon based on male adults. Female adults have not been described. Based on Eaton's (1884) descriptions of both the male of *P. vaciva* and the female of *P. rufivenosa*, and the fact that lectotypes of both species are from Mount Hood (Spieth 1941), we maintain that there is a strong possibility that the two will eventually prove to be conspecific.

Paraleptophlebia jenseni, NEW SPECIES

Male adult. Body length 7.5-9.0mm; forewing length 7.0-8.0mm. Color generally dark brown. Head: Coloration shining dark brown to black; antennae brown basally, pale apically; ocelli white; eyes meeting along midline, each divided, with upper portion tan and lower portion black. Thorax: Notum shining dark brown to black; pleura brown to dark brown (membranous areas light brown); sterna brown. Forewings stained brown in apical one-third to one-half, clear or only very faintly tinted basally; longitudinal veins light brown; crossveins pale, those in stigmatic area anastomosed. Hindwings clear throughout, with pale venation. Legs light brown to dark brown, mid- and hindlegs lighter; femora and foretibiae darker; apex of femora and base of tibiae with dark brown markings. Abdomen: Coloration generally brown with pale posterior margins on segments dorsally and pale markings on segments ventrally; segments 1-7 with dark spiracular markings. Terga 1-2 dark brown; terga 3-7 lighter brown and translucent, with darker paired submedian dashes anteriorly; terga 8-10 brown, opaque. Sterna 2-8 light to medium brown with paired submedian spots anteriorly; sternum 9 often with conspicuously lighter posteromedial area bordered by dark brownish black anterior area extending posterolaterally. Genitalia brown; forceps without dorsal enlargement at base; penes (Fig. 1) with deep, narrow, U- to V-shaped furcation; penal lobes produced apicolaterally into narrow-acute spine-like projections. Caudal filaments brown to gray basally, lighter apically.

Female adult. Unknown.

Material examined. Holotype: male adult, Washington, Klickitat County, Rock Creek, above Hwy bridge, V-31-1998, R. L. Newell. Paratypes: eight male adults, same collecting data as holotype. The holotype is deposited in the Purdue Entomological Research Collection (PERC), West Lafayette, Indiana. Paratypes are deposited in PERC and the C. P. Gillette Museum of Arthropod Diversity, Fort Collins, Colorado (CSU). Other material examined consisted of one male adult,

Washington, Klickitat County, Badger Gulch Creek Hwy bridge, V-31-1998, R. Newell; five male adults, Washington, Klickitat County, Holter Gulch Creek, upper station, V-16-1998, R. Newell; and 14 male adults with the same data as holotype.

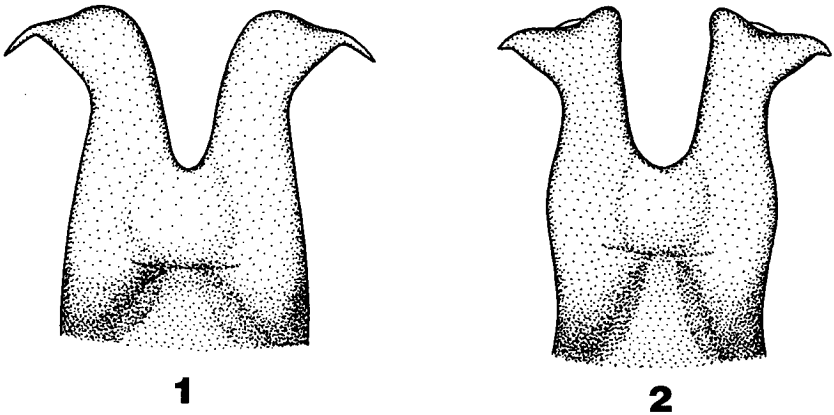
Discussion. *Paraleptophlebia jenseni* and *P. traverae* have penal lobes that are expanded somewhat laterally at their apices, but otherwise do not possess any recurved processes or incisions as many species do, but neither are they narrow and attenuated as those of *P. brunneipennis* (McDunnough). This particular penes type should allow these two species to be distinguished from other species of *Paraleptophlebia* in North America. Male adults of the two species can also readily be distinguished from each other. Those of *P. jenseni* have the forewings shaded with brown stain in the apical one-third to one-half, and the lateral aspect of the apices of the penal lobes are much more sharply pointed and elongate. For comparative figures of *Paraleptophlebia* spp. genitalia in general see Traver (1935) and Harper and Harper (1986).

Paraleptophlebia jenseni is known from Washington as indicated above. Based on Jensen (1966), it has also been taken from Marys Creek, six miles southeast of Grasmere in Owyhee County, Idaho. Because Klickitat County in Washington and Owyhee County in Idaho both adjoin the state of Oregon, it is reasonable to assume that *P. jenseni* will eventually be found in Oregon.

Paraleptophlebia traverae, NEW SPECIES

Paraleptophlebia rufivenosa, Traver, 1935:528. (misidentification).

Male adult. [The body of the single known specimen of this species is preserved in alcohol and is deteriorated and fragmented; however, a description of the color pattern was provided by Traver (1935), under *P. rufivenosa*, and the wings and genitalia are slide mounted and remain in good condition.] Wings completely hyaline, with no staining. Penes (Fig. 2) with lobes separated by broad U-shaped emargination, with apices broadly beak-like laterally, but not narrowly acute or spine-like.



Figs. 1-2. *Paraleptophlebia* penes (ventral view). 1. *P. jenseni*. 2. *P. traverae*.

Female adult. Unknown.

Material examined. Holotype male adult, Grangeville, Idaho, VI-27-1907, J. M. Aldrich (genitalia [in balsam] and one set of wings [dry mounted] on two slides). The holotype is deposited in the Cornell University Insect Collection, Ithaca, New York.

Discussion. *Paraleptophlebia traverae*, *P. jenseni*, and *P. brunneipennis* may form a closely related group of species within *Paraleptophlebia* based on their relatively simple penes lobes. *Paraleptophlebia traverae* is most similar to *P. jenseni*; however, the two are easily distinguished based on wing membrane staining and penes apices differences as discussed above, under *P. jenseni*.

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LITERATURE CITED

- Eaton, A. E.** 1883-88. A revisional monograph of recent Ephemeroidea or mayflies. Trans. Linn. Soc. London, Zool. Ser. 3: 1-352.
- Harper, F. and P. P. Harper.** 1986. An annotated key to the adult males of the northwestern Nearctic species of *Paraleptophlebia* Lestage (Ephemeroptera: Leptophlebiidae) with the description of a new species. Can. J. Zool. 64: 1460-1468.
- Jensen, S. L.** 1966. The mayflies of Idaho (Ephemeroptera). Unpublished Masters Thesis, Univ. Utah, Salt Lake City. 367pp.
- McCafferty, W. P.** 1996. The Ephemeroptera species of North America and index to their complete nomenclature. Trans. Am. Entomol. Soc. 122: 1-54.
- McDunnough, J.** 1924. New North American Ephemeroidea. Can. Entomol. 56: 221-226.
- Spieth, H. T.** 1941. The North American Ephemeroptera types of the Rev. A. E. Eaton. Ann. Entomol. Soc. Am. 34: 87-98.
- Traver, J. R.** 1935. Part II systematic. North American mayflies order Ephemeroptera, pp. 237-739. In: J. G. Needham, J. R. Traver and Y.-C. Hsu (eds.), The biology of mayflies. Comstock, Ithaca, New York.