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NEW RECORDS OF STONEFLIES (PLECOPTERA) WITH AN ANNOTATED CHECKLIST OF THE SPECIES FOR PENNSYLVANIA

E.C. Masteller

ABSTRACT

Original collections now record 134 species in nine families and 42 genera. Seventeen new state records include, Allocapnia wrayi, Alloperla caudata, Leuctra maria, Soyedina carolinensis, Tallaperla elisa, Perlesta decipiens, P. placida, Neoperla catharae, N. occipitalis, N. stewarti, Cultus decisus decisus, Isoperla francesca, I. frisoni, I. lata, I. nana, I. slossonae, Malirekus hastatus. Five species are removed from the list of species for Pennsylvania.

Surdick and Kim (1976) originally recorded 90 species of stoneflies in nine families and 32 genera from Pennsylvania. Since that time, Stark et al. (1986) reported 94 species, Stewart and Stark (1988) listed 95 species, and Earle (1994) added 14 species and deleted four species as misidentifications. Grubbs (1996) reported three new state records bringing the total species for Pennsylvania to 117. One-hundred-thirty-four species of stoneflies are now confirmed for Pennsylvania (Masteller, 1996). This includes 16 species of Capniidae, 13 species of Leuctridae, 16 species of Nemouridae and 10 species of Taeniopterygidae in the Euholognatha. In the Systellognatha, the Chloroperlidae are represented by 15 species, Peltoperlidae four species, Perlidae 25 species, Perlodidae 30 species, and the Pteronarcyidae five species. The county records for all Pennsylvania stonefly species can be found on the WWW at Penn State Erie, The Behrend College’s site (http://www.pserie.psu.edu/), biology faculty under my name.

Pennsylvania, with 67 counties (Figure 1) covers an area of 117,412 square kilometers (Guilday, 1985). The eastern border is located at approximately 74°43’ W longitude and extends to 80°31’ W on the western border. The southern border is located at 39°43’ latitude and approximately 42° N on the northern border. Fenneman (1938) divided the land surface of North America into 20 physiographic provinces. Berg et al. (1989) have developed a physiographic province map for Pennsylvania with seven major physiographic provinces: (1) Central Lowland (2) Atlantic Coastal Plain (3) Blue Ridge (4) New England (5) Ridge and Valley (with 2 subdivisions) (6) Piedmont Province (with 3 subdivisions) and (7) Appalachian Plateaus (with 7 subdivisions). The seven major physiographic units are dominated by the Appalachian Plateau which include glaciated and montane sections. There are over 100 water drainage subbasins in six major basins: Delaware River, Susquehanna River, Ohio River, Lake Erie, Genesee River, and Potomac River. Due to the great diversity of habitats throughout Pennsylvania, it is likely additional species will be collected in the future.

1 Penn State Erie, The Behrend College, Erie, PA 16563-0203.
Figure 1. Map of Pennsylvania, showing the counties.
These seven physiographic provinces provide an abundant range of habitats. The mountain streams at higher elevations provided some of the most diverse populations. More than 90 species inhabit the Appalachian Mountain Section of the Ridge and Valley Province in central Pennsylvania. Three sections of the Appalachian Plateaus Province, all mountainous have the next most diverse fauna with approximately 60 species in each section—Allegheny Mountain, High Plateau, and Mountainous High Plateau. Close to 40 species were present at lower elevations in the Central Lowland Province, Pittsburgh Low Plateau, Glaciated Low Plateau, and the Piedmont Upland. Areas with rare species occurred in the north central counties and in the Pocono area of eastern Pennsylvania.


The new state records and a current list of stoneflies of Pennsylvania follows.

NEW STATE RECORDS OF STONEFLIES IN PENNSYLVANIA

CAPNIIDAE


CHLOROPERLIDAE


LEUCTRIDAE


NEMOURIDAE

PELTOPERLIDAE

*Tallaperla elisa* Stark — 1♂ POTTER Co., Lyman Run, 28 May 1988, R. M. Duffield.

PERLIDAE


PERLODIDAE


*Isoperla lata* Frison 1♀ POTTER Co., Kettle Creek, Oleona, 4 May 1996. E. C. Masteller.


An annotated list of the Plecoptera of Pennsylvania. The range of adult collection dates is followed by the list of counties thus far recorded for each species.

**Euholognatha**

**CAPNIIDAE**

*Capniinae*

**Allocapnia aurora** **Ricker** – 23 Jan - 19 Mar: Adams, Blair, Chester, Cumberland, Dauphin, Huntingdon, Perry, York

* A. *curiosa **Frison** – 19 Feb - 8 Apr: Blair, Cambria, Clinton, Somerset

* A. *frisoni **Ross** & **Ricker** – 15 Nov - 14 Feb: Erie, Westmoreland


* A. *harperi **Kirchner** – 29 Jan - 4 Apr: Westmoreland

* A. *maria **Hanson** – 4 Feb - 1 Apr: Adams, Carbon, Columbia, Cumberland, Dauphin, Fulton, Lycoming, McKeans, Perry, Sullivan, Venango, Warren


* A. *pechumani **Ross** & **Ricker** – 16 - 17 Feb: Erie, Warren


* A. *recta* (Claassen) – 1 Dec - 7 Mar: Berks, Chester, Columbia, Cumberland, Dauphin, Indiana, Lycoming, Mifflin, Montgomery, Schuylkill, Somerset, Venango, Warren, Westmoreland

* A. *richeri **Frison** – 18 Nov - 13 Apr: Beaver, Bucks, Chester, CF, Crawford, Cumberland, Dauphin, Delaware, Fulton, Greene, Huntingdon, Juniata, Lancaster, Mifflin, Northumberland, Perry, Somerset, Union, Venango, Warren, Washington

* A. *simmonsi **Kondratieff** & **Voshell** – 8 - 24 Mar: Cumberland, Dauphin

* A. *vivipara* (Claassen) – 3 Jan - 26 Apr: Armstrong, Bucks, Crawford, Erie, Greene, Venango

* A. *wrayi **Ross** – [NEW RECORD] 16 Feb - 1 Mar: Chester, Greene, Mifflin

* A. *zola **Ricker** – 27 Jan - 27 Feb: Carbon, Perry, Westmoreland

**Paracapnia angulata** **Hanson** – 20 Mar - 4 May: Beaver, Cameron, Carbon, Centre, Clearfield, Clinton, Cumberland, Elk, Erie, Forest, Huntingdon, McKeans, Mifflin, Perry, Potter, Somerset, Susquehanna, Union, Warren, Washington

**LEUCTRIDAE**

**Leuctrinae**

*Leuctra alexanderi** **Hanson** – 30 May - 19 Jul: Forest, Warren, Wayne, Westmoreland

* L. *carolinensis** Claassen – 22 May - 14 Jun: Lackawana, Tioga
L. ferruginea (Walker) – 21 May - 30 Oct: Cameron, Carbon, Centre, Chester, Clinton, Cumberland, Delaware, Elk, Erie, Fayette, Forest, Franklin, Lawrence, Luzerne, McKean, Pike, Potter, Snyder, Sullivan, Tioga, Venango, Warren, Wayne, Westmoreland
L. grandis Banks – 8 May - 13 Jul: Centre, Lackawana, Luzerne, Potter, Sullivan, Westmoreland
L. maria Hanson – [NEW RECORD] 28 - 30 May: Pike, Wayne
L. truncata Claassen – 16 Jun - 3 Sep: Centre, Fayette, Potter, Warren
L. variabilis Hanson – 18 Aug - 10 Sep: Chester, Susquehanna, Wyoming

Megaleuctrinae

Megaleuctra flinti Baumann – 20 Apr - 18 Jul: Cambria, Somerset, Westmoreland

NEMOURIDAE

Amphinemurinae

Amphinemura appalachia Baumann – 3 May: Carbon, Monroe
A. delosa (Ricker) – 14 Apr - 10 Sep: Centre, Crawford, Elk, Erie, Forest, Huntingdon, Lawrence, Luzerne, Potter, Tioga, Westmoreland, Wyoming
A. linda (Ricker) – 13 Jun - 6 Jul: Columbia, Erie
A. nigritta (Provancher) – 21 Apr - 25 Sep: Berks, Blair, Cambria, Cameron, Centre, Chester, Clearfield, Clinton, Columbia, Crawford, Erie, Forest, Huntingdon, Juniata, Lawrence, Lycoming, McKean, Mifflin, Perry, Pike, Potter, Somerset, Sullivan, Warren, Wayne, Westmoreland

Nemourinae

Ostrocerca albidipennis (Walker) – 4 May - 29 Jun: Cumberland, Dauphin, Lackawana, Pike, Potter, Somerset, Warren, Westmoreland
O. complexa (Claassen) – 23 May: Lackawana
O. prolongata (Claassen) – 20 May: Tioga
O. truncata (Claassen) – 26 Apr - 20 May: Bucks, Fayette, Lycoming, Potter, Westmoreland, York

Paranemoura perfecta (Walker) – 22 Mar - 8 May: Centre, Forest, Huntington, Lebanon, Sullivan, Union, Westmoreland


P. similis (Hagen) – 9 Mar - 15 May: Cumberland, Delaware, Erie, Forest, Fulton, Huntingdon, Juniata, McKeen, Perry, Potter, Snyder, Westmoreland

Soyedina carolinensis (Claassen) – [NEW RECORD] 24 Feb - 11 Apr: Chester, Philadelphia

S. merritti Baumann & Grubbs – 1 Apr - 11 May: Westmoreland

S. vallicularia (Wu) – 14 Mar - 13 May: Beaver, Blair, Centre, Chester, Erie, Huntingdon, McKeen, Philadelphia, Sullivan, Venango, Warren, York

S. washingtoni (Claassen) – 28 Mar - 20 Jun: Centre, Erie, Lackawana, Lycoming, McKeen, Philadelphia Warren

TAENIOPTERYGIDAE

Brachypteryginae

Bolotoperla rossi (Frison) – 3 Apr - 8 May: Dauphin, Sullivan, Union

Oemopteryx contorta (Needham & Claassen) – 28 Feb - 3 May: Cumberland, Mifflin, Union, Westmoreland


Taeniopteryginae


T. nivalis (Fitch) – 28 Jan - 20 Apr: Bucks, Carbon, Chester, Crawford, Cumberland, Dauphin, Delaware, Erie, Forest, Franklin, Huntingdon, Lancaster, Mifflin, Northumberland, Snyder, Susquehanna, Tioga, Warren, Wyoming

T. parvula Banks – 10 Feb - 7 Mar: Cameron, Carbon, Cumberland, Dauphin, Luzerne, McKeen, Mifflin, Perry, Tioga, Wyoming

T. ugola Ricker & Ross – 14 Feb - 7 Apr: Cambria, Cumberland
Systellognatha
CHLOROPERLIDAE

Chloroperlinae

Alloperla aracoma Harper & Kirchner – 2 Jun - 11 Jul: Westmoreland

A. atlantica Baumann – 20 May - 4 Jul: Chester, Cumberland, Huntingdon, Monroe, Sullivan


A. chloris Frison – 18 May - 10 Jul: Crawford, Erie, Sullivan, Warren

A. concolor Ricker – 26 May: Luzerne, Monroe

A. imbecilla (Say) – 23 May - 5 Jul: Beaver, Cameron, Forest, Northampton, Wayne, Westmoreland

A. usa Ricker – 8 Jun - 23 Jul: Cambria, Warren, Westmoreland

A. vostoki Ricker – 18 Jun: Erie


Rasvena terna (Frison) – 3 Jun - 19 Jul: Lycoming


Sweltsa lateralis (Banks) – 11 May - 22 Jul: Cambria, Cameron, Centre, Clearfield, Clinton, Elk, Erie, Fayette, Forest, Fulton, Huntingdon, Lackawana, Lebanon, Luzerne, McKean, Mifflin, Pike, Sullivan, Tioga, Union, Venango, Warren, Westmoreland

S. naica (Provancher) – 10 May - 26 Jun: Blair, Monroe, Potter, Warren, Westmoreland


Paraperlinae

Utaperla gaspesiana Harper & Roy – 9 - 20 May: Clinton, Westmoreland

PELTOPERLIDAE

Peltoperlinae


Tallaperla anna (Needham & Smith) – 3 Jun: Luzerne


PERLIDAE

Acroneuriinae
Acroneurini


*A. arida* (Hagen) – 6 - 11 Jun: Chester, Dauphin, Delaware, Erie, Lancaster, Philadelphia

*A. carolinensis* (Banks) – 28 May - 10 Jul: Armstrong, Centre, Clinton, Crawford, Cumberland, Erie, Fayette, Lawrence, Lycoming, Monroe, Pike, Potter, Snyder, Susquehanna, Tioga, Union, Warren, Westmoreland

*A. evoluta* Klapalek – 30 May - 6 Jul: Allegheny, Beaver, Greene, Lancaster, Lawrence, Washington

*A. filicis* Frison – 26 - 30 Jun: Dauphin, Juniata

*A. frisoni* Stark & Brown – 16 Jun - 22 Jul: Allegheny, Erie, Greene, Lawrence


*A. rutila* ruralis* (Hagen)* – 1 - 8 Jul: Chester, Cumberland, Dauphin, Fayette, Lancaster, Lebanon, Potter, Tioga, Wyoming

*Eccoptura xanthenes* (Newman) – 2 Jun - 31 Jul: Centre, Chester, Cumberland, Montgomery, Northumberland, York

*Hansonoperla appalacchic Nelson* – 23 Jul:Cambria, Cameron, Monroe, Tioga

*Perlesta decipiens* (Walsh) – [NEW RECORD] 22 Jun - 30 Jul: Cameron, Crawford, Lawrence, Mercer

*P. nitida Banks* – 1 May - 30 Jun: Lawrence, Mercer, Philadelphia

*P. placida* (Hagen) – [NEW RECORD] 17 - 30 Jul: Crawford, Erie

*Perlinella drymo* (Newman) – 12 May - 9 Aug: Cumberland, Northampton

*P. ephyre* (Newman) – 6 Jun: Columbia, Cumberland

Perlinae

Neoperlini

*Neoperla catharae* Stark & Baumann – [NEW RECORD] 22 Jul - 10 Sep: Perry, Wyoming


*N. stewarti* Stark & Baumann – NEW RECORD] 29 - 30 Jun: Erie, Juniata

Perlini

*Agnetina annulipes* (Hagen) – 4 Jun - 16 Jul: Dauphin, Juniata, Pike


*A. flavescens* (Walsh) – 31 May - 27 Jul: Dauphin, Huntingdon, Lehigh

*Paragnetina immarginata* (Say) – 20 Jul - 28 Oct: Centre, Columbia,


**PERLOIDAE**

*Isoperlinae*

*Clioperla elio* (Newman) – 15 Apr - 8 May: Armstrong, Beaver, Chester, Crawford, Huntingdon, Westmoreland

*Isoperla bilineata* (Say) – 8 - 27 Jun: Allegheny, Centre, Chester, Huntingdon, Monroe, Potter

*I. dicala* Frison – 23 May - 10 Jul: Bedford, Blair, Clinton, Cumberland, Dauphin, Erie, Huntingdon, Pike, Potter, Sullivan, Tioga


*I. holochlora* (Klapalek) – 28 May - 31 Aug: Centre, Chester, Cumberland, Fayette, Monroe, Pike, Somerset, Tioga, Union, Warren, Westmoreland

*I. lata* Frison – [NEW RECORD] 4 May: Potter

*I. marlynia* (Needham & Claassen) – 4 - 6 Jun: Huntingdon, Sullivan

*I. montana* (Banks) – 17 Apr - 8 Jul: Cameron, Centre, Chester, Clinton, Crawford, Fayette, Huntingdon, Lycoming, Luzerne, Mifflin, Monroe, Pike, Potter, Sullivan, Union, Warren

*I. namata* Frison – 1 - 10 May: Centre, Potter

*I. nana* (Walsh) – [NEW RECORD] 5 May - 30 Jun: Erie, Lawrence, Venango

*I. orata* Frison – 8 May - 14 Jun: Armstrong, Chester, Huntingdon, Luzerne, Monroe, Sullivan

*I. richardsoni* Frison – 7- 8 May: Centre, Dauphin

*I. signata* (Banks) – 4 Jun: Centre, Fayette, Lancaster, Sullivan

*I. similis* (Hagen) – 1 May - 6 Jun: Centre, Chester, Fayette, Monroe, Pike, Potter, Somerset, Venango, Westmoreland

*I. slossonae* (Banks) – [NEW RECORD] 29 Apr: Clinton

*I. transmarina* (Newman) – 16 May - 3 Jun: Erie, Luzerne

*I. sp. j – 5 Jul: Forest

*I. sp. m – 27 May - 4 Jun: Cameron, Clinton

*I. sp. n – 29 Apr: Clinton

*Perlodinae*

*Diploperlini*


*Diploperla duplicata* (Banks) – 18 May - 2 Jun: Armstrong, Chester, Cumberland, Dauphin, Lycoming, Pike

*D. robusta* Stark & Gaufin – 11 May - 25 Jun: Cambria, Erie, Lancaster

Perlodini

**Helopicus subvarians** (Banks) – 28 Apr–19 May: Carbon, Dauphin, Huntingdon, Lycoming, Union

**Isogenoides hansonii** (Ricker) – 15 Apr - 10 May: Forest, Huntingdon, McKean, Monroe, Potter, Somerset, Warren

**Malirekus hastatus** (Banks) – [NEW RECORD] 8 May: Chester


**Yugus bulbosus** (Frison) – 14 May - 11 Jun: Potter, Somerset, Westmoreland

**PTERONARCYIDAE**

Pteronarcyinae

**Pteronarcys biloba** Newman – 23 May - 6 Jun: Centre, Clinton, Huntingdon, Luzerne, Lycoming, McKean, Monroe, Pike, Potter, Tioga, Union, Warren, Westmoreland

**P. comstocki** Smith – nymphs only: Clinton, Huntingdon, Pike

**P. dorsata** (Say) – 12 Apr - 19 May: Allegheny, Crawford, Dauphin, Huntingdon, Philadelphia, Union, Wayne

**P. pictettii** Hagen – 20 May: Huntingdon, Philadelphia


Several species of *Isoperla* that have only a letter designation will be described by Stanley Szczytko. Baumann and Grubbs (1996) have recently described *Soyedina merritti* from Pennsylvania. Baumann (1996) described *Amphinemura appalachia* with the type locality in Pennsylvania.

Five species are being deleted from the Pennsylvania list. These species have been removed because they were misidentified or their known occurrence was well outside the range of Pennsylvania. These are *Paracapnia opis* (Newman) reported in Frison (1942), *Sweltsa mediana* (Banks) reported in Surdick and Kim (1976), *Amphinemura varshava* (Ricker) reported in Surdick and Kim (1976), *Isoperla mohri* Frison reported in Surdick and Kim (1976), *Pteronarcys scotti* Ricker reported in Robertson (1980) as *Allonarcys scotti*.

An additional 39 species that have been reported from the neighboring states of New York, Ohio, Maryland, West Virginia, and Ontario, Canada are listed as potentially occurring in Pennsylvania (Appendix 1).

### ACKNOWLEDGMENTS

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Voucher specimens will be deposited at the Smithsonian Institution, National Museum of Natural History, Washington, DC, and the C. P. Gillette Museum of Arthropod Diversity, Colorado State University, Fort Collins, CO.

LITERATURE CITED


The following species of stoneflies are not on the Pennsylvania list. Because of their proximity of records and types of habitat, they may be found in Pennsylvania. I have included them so that future workers will be alert to their possible presence in the state.

**CAPNIIDAE**

*Allocapnia forbesi* Frison (OH, WV); *Allocapnia frumi* Kirchner (WV); *Allocapnia illinoensis* Frison (NY, OH, ON); *Allocapnia indianaec* Ricker (NY, OH); *Allocapnia loshada* Ricker (WV); *Allocapnia minima* (Newport)(NY, ON); *Allocapnia mystica* Frison(OH, WV); *Allocapnia ohiokensis* Ross & Ricker (NY, OH, WV); *Allocapnia smithi* Ross & Ricker (OH); *Capnia vernalis* (Newport) (OH, ON); *Capnura manitoba* Claassen (ON)

**LEUCTRIDAE**

*Leuctra biloba* Claassen (ON); *Leuctra rickeri* James (OH, WV); *Leuctra triloba* Claassen(NY); *Zealeuctra fraxina* Ricker & Ross (OH, WV)

**NEMOURIDAE**

*Nemoura trispinosa* Claassen (NY, OH, ON); *Shipsa rotunda* (Claassen) (MD, ON)

**TAENIOPTERYGIDAE**

*Oemopteryx glacialis* (Newport) (NY, ON); *Strophopteryx appalachia* Ricker & Ross (WV); *Taeniopteryx lonicera* Ricker & Ross (MD);

**CHLOROPERLIDAE**

*Alloperla banksi* Frison (NY, ON); *Alloperla idei* (Ricker) (OH); *Alloperla nanina* Banks (NY); *Alloperla voinae* Ricker (NY) *Haploperla orpha* (Frison) (ON); *Sweltsa pocahtonas* Kirchner & Kondratieff (WV)

**PELTOPERLIDAE**

*Peltoperla tarteri* Stark & Kondratieff (WV)

**PERLIDAE**

*Acroneuria internata* (Walker) (WV); *Perlesta adena* Stark (OH) (in PA but not confirmed); *Perlesta cinctipes* (Banks) (OH); *Neoperla gaufini* Stark & Baumann (OH); *Neoperla mainensis* Banks (OH, ON); *Claassenia sabulosa* (Banks) (ON)

**PERLODIDAE**

*Isogenoides frontalis* (Newman) (NY); *Isoperla burksii* Frison (OH, WV); *Isoperla cotta* Ricker (ON, WV); *Isoperla decepta* Frison (OH, ON); *Isoperla gibbsae* Harper (NY, WV); *Diploperla kanawholensis* Kirchner & Kondratieff (WV)