



## A REVIEW OF STONEFLY (INSECTA; PLECOPTERA) TAXONOMIC RESEARCH IN ALABAMA, WITH NEW STATE RECORDS AND AN UPDATED CHECKLIST

Scott A. Grubbs

Department of Biology and Center for Biodiversity Studies Western Kentucky University  
Bowling Green, KY 42101 U.S.A.  
E-mail: [scott.grubbs@wku.edu](mailto:scott.grubbs@wku.edu)

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### ABSTRACT

A brief review of the literature on the taxonomy of Alabama Plecoptera is presented. New state records of *Leuctra sibleyi* Claassen, *Zealeuctra claasseni* (Frison), *Perlesta decipiens* (Walsh), and *Isoperla decepta* Frison are provided and an updated checklist of 107 Alabama stonefly species is included.

**Keywords:** Plecoptera, stoneflies, Alabama, new records, checklist

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### INTRODUCTION

The first stonefly species described from type localities in Alabama did not occur until approximately 40 years ago, with *Taeniopteryx lonicera* (Ricker & Ross 1968) and *Allocaupnia polemistis* (Ross & Ricker 1971). The first inclusive treatment of the stonefly species of Alabama was completed by Audrey James in 1972 as an unpublished doctoral dissertation. Species-level taxonomic keys were provided for males and females, and distribution maps were included for each of the 52 species recorded from the state at that time. She included six species from Alabama as manuscript names, of which four (*Leuctra alabama*, *L. alta*, *L. cottaquilla*, and *Isoperla davis*) were formally described by her in 1974. A fifth manuscript species (*L. crossi*) was later described in James (1976) based largely on material she had initially referred to as *L. alexanderi* Hanson in James (1972). Two additional species of *Isoperla* were proposed as manuscript names in James (1972). One species (manuscript name of *I. scotti*) has since been described and renamed *I. jamesae* by Grubbs & Szczytko (2010) and the second species will be included in an upcoming

review of the eastern North America Isoperlinae (Szczytko & Kondratieff, in preparation).

Following James' work, Stark & Szczytko (1976) and Surdick (1981) described *Beloneuria jamesae* and *Alloperla hamata*, respectively, from Alabama. Sixteen new state records were listed in Stark & Harris (1986), increasing the then-known total to 71 species, and Young et al. (1989) added the first state record for the nemourid genus *Ostrocerca* (*O. truncata* (Claassen)). Harris et al. (1996) updated this total to 76 species based on new state records and taxonomic updates, incorporating new species discoveries by Stark & Lentz (1988; *Neoperla harrisi*) and Kondratieff & Kirchner (1996; *Hansonoperla cheaha*). Baumann (1996) described *Amphinemura alabama* from northern Alabama, Smith & Stark (1998) described *N. coosa* from central Alabama, and Stark (2004) reported on a tentative new state record of *Acroneuria petersi* Stark & Gaufin based only on females. Surdick & Stark (2004) described *A. prognoides* from southern Alabama and provided a new state record for *A. caudata* Frison, and Harrison & Stark (2010) supplied the first record of *Leuctra triloba* Claassen. Recent

collecting efforts by the author in the northern portion of the state, and collaborative research with Andrew L. Sheldon in the Talladega National Forest region, has resulted in several new species discoveries and new state records (Grubbs 2005, 2006, 2008, 2010; Grubbs & DeWalt 2008; Grubbs & Sheldon 2008, 2009). At present, 21 species of stoneflies have type localities in Alabama (Table 1).

## RESULTS

Four new records, an amended state record, and an updated checklist of the stoneflies reported from Alabama are presented below. Specimens are deposited in the Center for Biodiversity Studies, Western Kentucky University (WKU) and the Stark Collection, Mississippi College, Clinton, Mississippi (BPS).

Table 1. List of stonefly species with Alabama type localities.

| Family           | Species                                           | County     | Reference                   |
|------------------|---------------------------------------------------|------------|-----------------------------|
| Capniidae        | <i>Allocaupnia menawa</i> Grubbs & Sheldon        | Clay       | Grubbs & Sheldon 2008       |
|                  | <i>A. muskogee</i> Grubbs & Sheldon               | Cleburne   | Grubbs & Sheldon 2008       |
|                  | <i>A. polemistis</i> Ross & Ricker                | Walker     | Ross & Ricker 1971          |
|                  | <i>A. sano</i> Grubbs                             | Madison    | Grubbs 2006                 |
|                  | <i>A. tsalagi</i> Grubbs                          | Jackson    | Grubbs 2008                 |
| Leuctridae       | <i>Leuctra alabama</i> James                      | Jackson    | James 1974                  |
|                  | <i>L. alta</i> James                              | Calhoun    | James 1974                  |
|                  | <i>L. cottaquilla</i> James                       | Calhoun    | James 1974                  |
|                  | <i>L. crossi</i> James                            | Calhoun    | James 1976                  |
|                  | <i>L. pinhoti</i> Grubbs & Sheldon                | Cleburne   | Grubbs & Sheldon 2009       |
|                  | <i>Zealeuctra talladega</i> Grubbs                | Clay       | Grubbs 2005                 |
| Nemouridae       | <i>Amphinemura alabama</i> Baumann                | Limestone  | Baumann 1996                |
| Taeniopterygidae | <i>Taeniopteryx lonicera</i> Ricker & Ross        | Blount     | Ricker & Ross 1968          |
| Chloroperlidae   | <i>Alloperla hamata</i> Surdick                   | Jackson    | Surdick 1981                |
|                  | <i>A. prognoides</i> Surdick & Stark              | Baldwin    | Surdick 2004                |
| Perlidae         | <i>Beloneuria jamesae</i> Stark & Szczytko        | Clay       | Stark & Szczytko 1976       |
|                  | <i>Hansonoperla cheaha</i> Kondratieff & Kirchner | Cleburne   | Kondratieff & Kirchner 1996 |
|                  | <i>Neoperla coosa</i> Smith & Stark               | Chilton    | Smith & Stark 1998          |
|                  | <i>N. harrisi</i> Stark & Lentz                   | Lauderdale | Stark & Lentz 1988          |
| Perlodidae       | <i>Isoperla davisii</i> James                     | Tallapoosa | James 1974                  |
|                  | <i>I. jamesae</i> Grubbs & Szczytko               | Lauderdale | Grubbs & Szczytko 2010      |

## New state records

*Leuctra sibleyi* Claassen is distributed broadly across the eastern Nearctic region (DeWalt et al. 2010). This headwater species was collected recently in northwestern Alabama, representing a new state record and a southwestern range extension.

**Material examined.** U.S.A., Alabama, Colbert Co., tributary to Ross Branch, CR 1, 6 km SE Waterloo, 4 May 2008, S.A. Grubbs, 1♂ (WKU); Lauderdale Co., Second Creek, CR 126 at CR 1, 9 km NE Waterloo, 4 May 2008, S.A. Grubbs, 1♂ (WKU).

*Zealeuctra claasseni* (Frison) has been recorded from Kansas east to West Virginia and south to Texas (Ricker & Ross 1969; DeWalt et al. 2010). This upland stream species has been collected recently from northwestern Alabama, representing a new state record.

**Material examined.** U.S.A., Alabama, Lauderdale Co., CR 14, Gravelly Springs, ca. 0.5 mi W Natchez Trace Parkway, 15 March 2010, B.P. Stark, 1♂ (BPS).

*Perlesta decipiens* (Walsh) is a variable species that is widely distributed across the central and eastern U.S. (Stark 2004; DeWalt et al. 2010). This species is common in large streams and small rivers in the Talladega National Forest region in east-central Alabama, and is likely distributed broadly across the northern and central portions of the state.

**Material examined.** U.S.A., Alabama, Calhoun Co., Terrapin Creek, U.S. 278 at CR 33, 4 km NE Piedmont, 17 May 2008, S.A. Grubbs, 2♂, 3♀ (WKU); Clay Co., Enitachopco Creek, CR 35, 9 km ESE Millersville, 17 May 2008, S.A. Grubbs, 3♂, 6♀ (WKU); Talladega Co., Smelley Creek, CR 234 26 May 2006, A.L. Sheldon, 4♂, 8♀ (WKU).

*Isoperla decepta* Frison has been reported from southern Ontario south to Kentucky and Missouri (DeWalt et al. 2010). This species has been recently collected in northern Alabama, representing a new state record and a small southern range extension.

**Material examined.** U.S.A., Alabama, Lauderdale Co., Anderson Creek, 6 km NE Rogersville, 21 April 2002, S.A. Grubbs, 1♂, 6♀ (WKU); Limestone Co., Cairo Branch, Elk River, 16 km NE Rogersville, 21 April 2002, S.A. Grubbs, 3♂, 5♂, 3 nymphs (WKU).

## Amended state record

### *Sweltsa hoffmani* Kondratieff & Kirchner

Grubbs & Sheldon (2008) provided the first confirmed Alabama state record of *Sweltsa onkos* (Ricker) from Talladega National Forest. Kondratieff & Kirchner (2009) has since partitioned this species into a northern and eastern form (*S. onkos*) known from Atlantic Canada south to Virginia and recently-described second species (*S. hoffmani*) distributed from western New York south to eastern Tennessee. This specimen has since been reexamined and determined as *S. hoffmani*. The prior Alabama records (James 1972, Stark & Harris 1986, Surdick 2004) for *Sweltsa* (as *S. mediana* (Banks)) were based on females, yet are likely *S. hoffmani*. Females of *S. hoffmani*, *S. mediana*, and *S. onkos* are very difficult to distinguish and the distribution of *S. mediana* is in the southern Appalachian Mountains only from southwestern Virginia south to northwestern South Carolina. In addition, a second state record of *S. hoffmani* is now confirmed from the far northwestern portion of the state.

**Material examined.** U.S.A., Alabama, Cleburne Co., small stream draining Dugger Mountain, Talladega National Forest, 22 May 2006, A.L. Sheldon, 1♂ (WKU); Colbert Co., tributary to Ross Branch, CR 1, 6 km SE Waterloo, 4 May 2008, S.A. Grubbs, 1♂ (WKU).

### Checklist of Alabama Plecoptera (order follows DeWalt et al. 2010)

With the additions and the amendments listed above, the total number of species recorded from Alabama currently stands at 107. The *Isoperla* list, however, should be viewed as incomplete until the eastern North America Isoperlinae (Szczytko & Kondratieff, in preparation) study has been completed. James (1972) also reported *I. holochlora* (Klapálek) and *Hydroperla crosbyi* (Needham & Claassen; as *Isogenus crosbyi*) from Alabama, but neither is listed below. Stark & Harris (1986) skeptically omitted the *I. holochlora* record, a position that I am similarly and conservatively following here, and the *H. crosbyi* record was based on a single female that has not been located and reexamined.

Superfamily Group Euholognatha

Family Capniidae

*Allocapnia aurora* Ricker  
*A. granulata* (Claassen)  
*A. menawa* Grubbs & Sheldon  
*A. muskoguee* Grubbs & Sheldon  
*A. mystica* Frison  
*A. nivicola* (Fitch)  
*A. polemistis* Ross & Ricker  
*A. recta* (Claassen)  
*A. rickeri* Frison  
*A. sano* Grubbs  
*A. smithi* Ross & Ricker  
*A. tennesse* Ross & Ricker  
*A. tsalagi* Grubbs  
*A. virginiana* Frison  
*Nemocapnia carolina* Banks

Family Leuctridae

*Leuctra alabama* James  
*L. alta* James  
*L. biloba* Claassen  
*L. carolinensis* Claassen  
*L. cottaquilla* James  
*L. crossi* James  
*L. ferruginea* (Walker)  
*L. grandis* Banks  
*L. moha* Ricker  
*L. pinhoti* Grubbs & Sheldon  
*L. rickeri* James  
*L. sibleyi* Claassen  
*L. tenuis* (Pictet)  
*L. triloba* Claassen  
*L. usdi* Grubbs  
*Paraleuctra sara* (Claassen)  
*Zealeuctra claasseni* (Frison)  
*Z. fraxina* Ricker & Ross  
*Z. talladega* Grubbs

Family Nemouridae

*Amphinemura alabama* Baumann  
*A. appalachia* Baumann  
*A. delosa* (Ricker)  
*A. mockfordi* (Ricker)  
*A. nigrutta* (Provancher)  
*A. wui* (Claassen)  
*Ostrocerca truncata* (Claassen)

*Prostoia completa* (Walker)  
*Shipsa rotunda* (Claassen)  
*Soyedina alexandria* Grubbs

Family Taeniopterygidae

*Oemopteryx contorta* (Needham & Claassen)  
*Strophopteryx fasciata* (Burmeister)  
*Taeniopteryx burksi* Ricker & Ross  
*T. lita* Frison  
*T. lonicera* Ricker & Ross  
*T. maura* (Pictet)  
*T. metequi* Ricker & Ross  
*T. ugola* Ricker & Ross

Superfamily Group Systellognatha

Family Chloroperlidae

*Alloperla atlantica* Baumann  
*A. caudata* Frison  
*A. chloris* Frison  
*A. hamata* Surdick  
*A. idei* (Ricker)  
*A. prognoides* Surdick & Stark  
*A. usa* Ricker  
*Haploperla brevis* (Banks)  
*Sweltsa hoffmani* Kondratieff & Kirchner

Family Perlidae

*Acroneuria abnormis* (Newman)  
*A. arenosa* (Pictet)  
*A. carolinensis* (Banks)  
*A. evoluta* Klapálek  
*A. filicis* Frison  
*A. frisoni* Stark & Brown  
*A. perplexa* Frison  
*A. petersi* Stark & Gaufin  
*Agnetina annulipes* (Hagen)  
*A. flavescens* (Walsh)  
*Attaneuria ruralis* (Hagen)  
*Beloneuria jamesae* Stark & Szczytko  
*Eccopectura xanthenes* (Newman)  
*Hansonoperla cheaha* Kondratieff & Kirchner  
*Neoperla carlsoni* Stark & Baumann  
*N. catharae* Stark & Baumann  
*N. clymene* (Newman)  
*N. coosa* Smith & Stark  
*N. harrisi* Stark & Lentz  
*N. occipitalis* (Pictet)  
*N. stewarti* Stark & Baumann

*Paragnetina fumosa* (Banks)  
*P. kansensis* (Banks)  
*Perlesta decipiens* (Walsh)  
*P. placida* (Hagen)  
*P. shawnee* Grubbs  
*P. teaysia* Kirchner & Kondratieff  
*Perlinella drymo* (Newman)  
*P. ephyre* (Newman)  
*P. zwicki* Kondratieff, Kirchner & Stewart

#### Family Perlodidae

*Clioperla clio* (Newman)  
*Diploperla duplicata* (Banks)  
*D. robusta* Stark & Gaufin  
*Helopicus bogaloosa* Stark & Ray  
*H. subvarians* (Banks)  
*Isoperla bilineata* (Say)  
*I. davisii* James  
*I. decepta* Frison  
*I. dicala* Frison  
*I. jamesae* Grubbs & Szczytko  
*Remenus bilobatus* (Needham & Claassen)

#### Family Peltoperlidae

*Tallaperla cornelia* (Needham & Smith)  
*T. laurie* (Ricker)  
*T. maria* (Needham & Smith)

#### Family Pteronarcyidae

*Pteronarcys biloba* Newman  
*P. dorsata* (Say)

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