

## Mayflies (Ephemeroptera) of the Great Plains. II: Iowa

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### ABSTRACT

A total of 15 families, 43 genera, and 106 species of Ephemeroptera are reported from Iowa, including the first state records for six genera and 27 species. The 224 historical records associated with the 79 species previously documented from Iowa are comprehensively reviewed for the first time. Besides new state records, 548 new county records are provided for 83 of the species. Mayflies are now known from 91 of the 99 Iowa counties and are well represented in both the western, Missouri River Drainage and the central/eastern, Mississippi River Drainage Systems. Low-gradient, sand-silt bottomed streams, found in much of Iowa and typical of the Great Plains, provide ideal habitat for mayflies in genera such as *Centroptilum* Eaton, *Cercobrachys* Soldán, *Fallceon* Waltz and McCafferty, *Paracloeodes* Day, *Procloeon* Bengtsson, *Ephoron* Williamson, and *Hexagenia* Walsh. Species of Baetidae and Heptageniidae often are predominant in benthic communities of Iowa streams. Affinities of the Iowa fauna are primarily eastern, and Iowa forms part of the known western range limits of at least 21 species, northern limits of two species, and eastern limit of one species.

### INTRODUCTION

Needham (1920) provided the first reports of mayflies from Iowa, including two species now known as *Anthopotamus verticis* (Say) and *Pentagenia vittigera* (Walsh). *Anthopotamus verticis* had been originally described by Say (1839) from Indiana, and *P. vittigera* had been described by Walsh (1862) from Rock Island, Illinois, just across the Mississippi River from Davenport, Iowa. McDunnough (1929, 1931a, 1931b) provided Iowa records for an additional seven species, Hendrickson (1930) added three species in an early but incomplete listing of Iowa

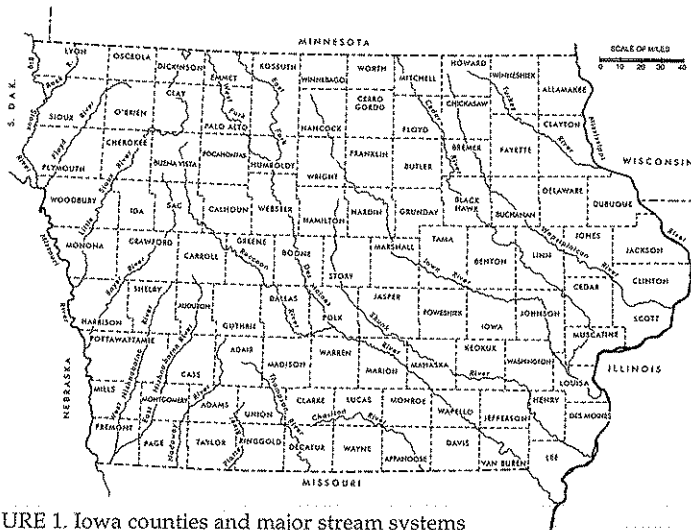


FIGURE 1. Iowa counties and major stream systems

species, and Traver (1931, 1935) added another 11 species for Iowa, bringing the documented total number by the year 1935 to 23. After Traver's (1935) North American species accounts but prior to the listing of Iowa Mayflies by Thew (1956), only one additional species had been documented from Iowa when Burks (1946) described *Heptagenia diabasia* Burks. The first report of *Heptagenia elegantula* (Eaton) from Iowa, by Daggy (1945), has proven to be a misidentification of *H. diabasia* (Bednarik and Edmunds 1980).

The first important listing of Iowa mayflies was provided by Thew (1956). Thew added another seven species for Iowa, but in total documented valid records for only 26 nominal species, and thus had missed some of the historical records of Iowa species. Between the latter listing of Iowa mayflies and a subsequent listing that was to be given by Klubertanz (1995), another six species from Iowa were documented (Thew 1957, Pescador and Berner 1981, Provonsha 1990, Lugo-Ortiz et al. 1994, McCafferty 1994, McCafferty and Klubertanz 1994). In total prior to 1995, there were only 37 valid mayfly species known from Iowa.

The most significant contribution to Iowa mayfly faunistics prior to this time was provided by Klubertanz (1995). In his work, new Iowa record data were provided for an additional 32 species, nearly doubling the known number of documented Iowa species. More recently, 10 more species were added to the known Iowa fauna by McCafferty and Hubbard (1998), bringing the documented total prior to the present work to 79 valid species.

The present work on Iowa mayflies represents the second installment in a series of publications treating the faunistics of the mayflies of the Great Plains of the United States [see Part I: Nebraska (McCafferty et al. 2001)]. Here, we comprehensively review the historical records associated with the Iowa mayfly fauna for the first time and contribute new state record data for an additional 27 species. We thus provide new or reviewed faunistic data for 106 species of Ephemeroptera in Iowa. Along with the review of 223 historical county records for the 79 species previously documented from Iowa, we provide 548 new county records for 82 species.

We have also established herein the first Iowa records for the genera *Acerpenna* Waltz and McCafferty, *Brachycercus* Curtis, *Cercobranchys* Soldán, *Dannella* Edmunds, *Serratella* Edmunds, and *Ephemera* Linnaeus. The genus *Epeorus* Eaton has not been

reported from Iowa previously, and we are unable to present specific data for Iowa *Epeorus* herein. However, there has been adult material from Iowa identified as *Epeorus pleuralis* (Banks) in the Purdue Entomological Research Collection (A. Provonsha, pers. comm.), and there also exists an immature specimen tentatively identified as *E. vitreus* (Walker) in an aquatic invertebrate collection held at Northern Iowa University (K. Pontasch, pers. comm.). Unfortunately, the precise locale and time of collections of these materials are not known and definite records cannot yet be established. *Eurylophella* Tiensuu is another genus that has not been known from Iowa. We have seen young larvae of *Eurylophella* from northeastern Iowa, but because they are unidentifiable to species due to their immaturity, definite records of *Eurylophella* species also cannot be given at this time.

Record data are presented similar to that in McCafferty et al. (2001), with county names given in ALL CAPS. When previous cited records did not originally give the county location, that county has been added with brackets, as have any additions or corrections to previously published data that we have been able to ascertain. New records are based on either larvae or adults. When based on larvae, water-course names are indicated, and when based on adults, a place name is indicated without a particular indication of a water course. When records are based on both larvae and adults, such is indicated.

Materials on which new records are based are housed at the following locations, as indicated by their lower-case abbreviations used herein: C. P. Gillette Museum, Colorado State University, Fort Collins, CO (csu); Cornell University Insect Collection, Ithaca, NY (cu); Iowa Hygienic Laboratory, University of Iowa, Iowa City, IA (ihl); Illinois Natural History Survey, Urbana, IL (inhs); Iowa State University Insect Collection, Ames, IA (isu); Purdue Entomological Research Collection, Purdue University, West Lafayette, IN (perc); the private collection of T. H. Klubertanz, Department of Biological Sciences, University of Wisconsin - Rock County, Janesville, WI (thk); and the National Water Quality Laboratory, U. S. Geological Survey, Denver, CO (wql).

Short remarks on many of the species are also included in order to elucidate any faunistic significance in Iowa. For example, Iowa is now known to form part of the western distributional limits in the United States for numerous eastern North American species, and in a few cases the eastern or northeastern limits for a few mainly western species. A map of Iowa (Fig. 1) showing counties and major river courses in the state is included as a convenience to the reader.

## FAUNISTIC DATA

### BAETIDAE

#### *Acentrella ampla* Traver

*New data.*—CLAYTON: Bloody Run Cr, 43/02/09N 91/16/04W, and West Fork Sny Magill Cr, 42/58/33N 91/14/15W, X-16-2001 (ihl).

*Remarks.*—The discovery of this species in Iowa connects the common Midwestern distribution of this species with its westernmost presence in Nebraska (McCafferty et al. 2001)

#### *Acentrella parvula* (McDunnough)

*Previous data.*—Klubertanz (1995) as *Baetis armillatus* McCafferty and Waltz: FAYETTE (Volga R); [WEBSTER] (Des Moines R).

*New data.*—CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996, West Nodaway R, 41/09/48N 94/55/42W, VIII-19-1998 (ihl). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-7-1994, Wapsipinicon R, 43/00/40N 92/23/20W, IX-06-1994 (ihl). DAVIS: Fox R, at US Hwy 63, N Bloomfield, and North Fabius R at

US Hwy 63, N Bloomfield, IX-11-2001 (perc). FLOYD: Flood Cr nr Powersville, 42/54/26N 92/43/14W, VIII-19-1996 (wql). GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc). HAMILTON: quarry, 5 mi NE Story City, VII-03-1991 (thk). HARDIN: S Frk Iowa R NE New Providence, 42/18/55N 93/09/07W, VIII-26-1996 (wql). HOWARD: Turkey R, 5 mi S Cresco, IX-21-1991 (thk). MADISON: Howerdon Cr, 41/21/36N 94/06/34W, VI-19-1995, and Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). MARSHALL: Burnett Cr, 42/04/47N 92/54/19W, VIII-22-2000 (ihl). MONONA: Soldier R, 1 mi SW Ute, at St Rd 183, IX-12-2001 (perc). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, and Little Floyd R, 43/08/41N 95/49/15W, IX-14-1999, Little Waterman Cr, 43/04/45N 95/27/31W, VII-09-1996, and Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (ihl). STORY: South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, VI-20-1987 to VI-25-1992 (thk). WINNESHIEK: Upper Iowa R, Kendallville, IX-22-1991 (thk). WORTH: Willow Cr, 43/16/36N 93/21/31W, VIII-17-1995 (ihl).

#### ***Acentrella turbida*** (McDunnough)

*Previous data.*—Klubertanz (1995) as *A. carolina* (Banks): [WINNESHIEK] (Upper Iowa R).

*New data.*—ALLAMAKEE: Yellow R, 43/06/47N 91/14/01W, IX-29-1998 (ihl). BUCHANAN: Lime Cr, 42/19/45N 91/58/55W, V-12-1998 (ihl). FAYETTE: Dibble Cr, 43/01/34N 91/40/08W, VIII-4-1998 (ihl). FLOYD: Little Cedar R, 43/09/08N 92/38/37W, X-03-1995 (ihl). HAMILTON: White Fox Cr, 42/32/10N 93/47/15W, VIII-25-1995 (ihl). KOSSUTH: Black Cat Cr, 43/09/22N 94/17/18W, VIII-13-1997 (ihl). LINN: Buffalo Cr, 42/12/20N 91/26/45W, VIII-28-1996 (ihl). MADISON: Howerdon Cr, 41/21/36N 94/06/34W, VI-19-1995 (ihl). WEBSTER: Prairie Cr, 42/23/20N 94/4/43W, VIII-22-1996 (ihl). WINNESHIEK: Canoe Cr, 43/22/01N 91/37/05W, IX-09-1997 (ihl). WRIGHT: Iowa R nr Rowan, 42/45/36N 93/37/23W, VIII-12-1996 (wql).

*Remarks.*—This widespread species is mostly found in riffle areas of summer-cool, high-quality streams.

#### ***Acerpenna macdunnoughi*** (Ide)

*New data.*—CLAYTON: Sny-Magill Cr, 42/58/87N 91/14/44W, IV-17-1995 (ihl).

#### ***Acerpenna pygmaea*** (Hagen)

*New data.*—DAVIS: Fox R, 40/43/50N 92/16/43W, X-2-1998 (ihl).

#### ***Baetis brunneicolor*** McDunnough

*Previous data.*—Klubertanz (1995): [WINNESHIEK] (Upper Iowa R).

*New data.*—ALLAMAKEE: Yellow R, 43/06/47N 91/14/01W, IX-29-1998 (ihl). BLACK HAWK: Elk Run Cr, 42/28/21N 92/15/42W, X-05-1999 (ihl). CLAYTON: Sny Magill Cr, 42/58/04N 91/13/24W, 1991-2001 (ihl). CLINTON: Elk R, 42/01/06N 90/13/48W, VIII-17-1999 (ihl). DELAWARE: Ram Hollow Cr, 42/37/47N 91/10/08W, VI-19-2000 (ihl). DUBUQUE: Lytle Cr, 42/19/13N 90/45/53W, VIII-16-1999 (ihl). FAYETTE: Dibble Cr, 43/01/34N 91/40/08W, VIII-04-1998 (ihl). MADISON: North Branch North R, 41/27/13N 94/04/15W, 1994-2000 (ihl). SCOTT: Lost Cr, 41/40/53N 90/23/48W, IX-10-1998, Burr Oak Cr, 43/19/21N 92/44/09W, VIII-14-1995 (ihl). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl).

#### ***Baetis flavistriga*** McDunnough

*Previous data.*—Klubertanz (1995): FAYETTE (Volga R); GUTHRIE (Middle Raccoon R); HAMILTON (near Story City).

*New data*.—ALLAMAKEE: Yellow R, Mountain Maple Hollow Preserve, VII-27-1991 (thk). BLACK HAWK: Cedar Falls, VIII-04-1974 (perc). BOONE: Des Moines R, Ledges St Prk IX-28-1965, IV-30-1971 (isu). BUCHANAN: Pine Cr, 42/27/06N 91/48/10W, VIII-28-1997 (ihl). CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996 (ihl). CHEROKEE: unnamed trib West Fork Little Sioux R, nr Kingsley (csu). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994, and Wapsipinicon R, 43/00/40N 92/23/20W, IX-06-1994 (ihl). CLINTON: Silver Cr, 41/50/50N 90/34/39W, VII-21-1998 (ihl). CRAWFORD: Otter Cr, 42/06/32N 95/19/44W, VIII-13-1998 (ihl). DELAWARE: Plum Cr, 42/23/01N 91/14/24W, IX-04-1997 (ihl). DUBUQUE: Little Maquoketa R, 42/30/58N 90/50/01W, IX-21-1995 (ihl). FAYETTE: Volga R, 42/49/09N 91/53/04W, IX-20-95 (ihl). GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). GUTHRIE: Deer Cr, 41/32/42N 94/19/04W, VII-30-1998 (ihl). HOWARD: Turkey R, 5 mi S Cresco, IX-21-1991 (thk). LINN: Indian Cr, 42/06/35N 91/33/40W, IX-29-2000 (ihl). MADISON: Howerdon Cr, 41/21/36N 94/06/34W, VI-19-1995 (ihl). MITCHELL: Cedar R at Spring Prk, 2 mi W Osage, IX-13-2001 (perc); Burr Oak Cr, 43/19/21N 92/44/09W, VIII-14-1995 (ihl). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, IX-14-1999 (ihl). POLK: Walnut Cr, 41/35/44N 93/42/57W, VIII-26-1998 (ihl). STORY: Iowa St Univ Hinds Irrigation Farm, Ames, VI-16-1988, South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, IX-11-1987 (thk). WEBSTER: Prairie Cr, 42/23/20N 94/4/43W, VIII-22-1996 (ihl). WINNESHIEK: South Bear Cr, at Co Rd A24, 2.5 mi E Highlandville, and North Bear Cr, off Co Rd A24, above confluence with South Bear Cr, 3 mi E Highlandville, IX-13-2001 (perc); Canoe Cr, 43/22/01N 91/37/05W, IX-09-1997 (ihl).

#### **Baetis intercalaris** McDunnough

*Previous data*.—Klubertanz (1995): [DICKINSON] (Lake Okoboji); [HOWARD] (Upper Iowa R); STORY ([South] Skunk R); VAN BUREN (Des Moines R).

*New data*.—ALLAMAKEE: Yellow R, Mountain Maple Hollow Preserve, VII-27-1991 (thk). APPANOOSE: Chariton R at St Rd 2 E Centerville, IX-11-2001 (perc). AUDUBON: Troublesome Cr, at Co Rd 58, IX-12-2001 (perc). BUCHANAN: Pine Cr, 42/27/06N 91/48/10W, VIII-28-1997 (ihl). BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996, West Nodaway R, 41/09/48N 94/55/42W, VIII-19-1998 (ihl). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994, East Fork Wapsipinicon R, 43/08/30N 92/22/26W, X-02-1995, Wapsipinicon R, 43/00/40N 92/23/20W, IX-06-1994 (ihl). CRAWFORD: Otter Cr, 42/06/32N 95/19/44W, VIII-13-1998 (ihl). DAVIS: North Fabius R, at US Hwy 63, SW Bloomfield, and Fox R, at US Hwy 63 N Bloomfield, IX-11-2001 (perc). DELAWARE: Plum Cr, 42/23/01N 91/14/24W, IX-4-1997 (ihl). DUBUQUE: Little Maquoketa R, 42/30/58N 90/50/01W, IX-21-1995 (ihl). FAYETTE: Volga R, VI-27, VIII-14-1990 (isu). FRANKLIN: Beeds Lake St Prk, VII-15-1991 (thk). GREENE: West Buttrick Cr above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc); Deer Cr, 41/32/42N 94/19/04W, VII-30-1998 (ihl). HAMILTON: quarry, 5 mi NE Story City, VII-03-1991, and Beaver Cr, K Young Prk, Webster City, IX-10-1991 (thk). LINN: Indian Cr, 42/06/35N 91/33/40W, IX-29-2000 (ihl). MADISON: Howerdon Cr, 41/21/36N 94/06/34W, VI-19-1995, and Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). MARSHALL: Burnett Cr, 42/04/47N 92/54/19W, VIII-22-2000 (ihl). MITCHELL: Cedar R at Spring Prk, 2 mi W Osage, IX-13-2001 (perc); Burr Oak Cr, 43/19/21N 92/44/09W, VIII-14-1995 (ihl). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, IX-14-1999, and Little Waterman Cr, 43/04/45N 95/27/31W, VII-09-1996, and Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). POCAHONTAS: Big Cedar Cr, N Laurens, IX-13-2001 (perc). POLK: Walnut Cr, 41/35/44N 93/42/57W, VIII-26-

1998 (ihl). SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (IHL). UNION: Platte R, at St Rd 25, IX-11-2001 (perc). VAN BUREN: Des Moines R, at Farmington, 40/38/25N 99/44/52W, and Fox R, at St Rd 2, IX-10-2001 (perc). WEBSTER: Prairie Cr, 42/23/20N 94/4/43W, VIII-22-1996 (ihl). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl). WINNESHIEK: Upper Iowa R, Kendallville, IX-22-1991 (thk); Canoe Cr, 43/22/01N 91/37/05W, IX-9-1997 (ihl). WORTH: Willow Cr, 43/16/36N 93/21/31W, VIII-17-1995 (ihl).

*Remarks.*—This species and the closely related *B. flavistriga* (*fuscatus* group) (see Morihara and McCafferty 1979) are often found co-occurring in Iowa streams. *Baetis intercalaris* apparently is the most common and ubiquitous species of *Baetis* Leach in Iowa.

#### ***Baetis tricaudatus* Dodds**

*Previous data.*—Klubertanz (1995): ALLAMAKEE (Yellow R); BOONE (Des Moines R).

*New data.*—ALLAMAKEE: French Cr, 43/22/38N 91/23/50W, VII-01-1996 (ihl). CLAYTON: Sny Magill Cr, 42/58/04N 91/13/24W, 1991-2001 (ihl). DELAWARE: Ram Hollow Cr, 42/37/47N 91/10/08W, VI-19-2000 (ihl). DUBUQUE: Catfish Cr, 42/25/04N 90/45/52W, VII-27-1995 (ihl). FAYETTE: Dibble Cr, 43/01/34N 91/40/08W, VIII-04-1998 (ihl). WINNESHIEK: South Bear Cr, at Co Rd A24, 2.5 mi E Highlandville, IX-13-2001 (perc); Canoe Cr, 43/22/01N 91/37/05W, IX-9-1997 (ihl).

#### ***Callibaetis ferrugineus* (Walsh)**

*Previous data.*—Traver (1935): MUSCATINE (Fairport).

*New data.*—HAMILTON: Little Wall Lake, VI-21,28-1992 (thk). STORY: Ames, V-25-1951, VI-19-1951 (isu). WOODBURY: farm pond, V-4-1997 (thk).

#### ***Callibaetis floridanus* Banks**

*Previous data.*—Klubertanz (1995): MARION (Pella Wildlife Area).

*Remarks.*—The Iowa record and Indiana records (Randolph and McCafferty 1998) for this mainly southern species represent the northernmost limits of its known range.

#### ***Callibaetis fluctuans* (Walsh)**

*Previous data.*—Traver (1935): MUSCATINE (Fairport).

*New data.*—BENTON: Blairstown, Keystone, VIII-12-1933 (cu). BOONE: Ledges St Prk, VI-19-1968 (isu). DECATUR: Elk Cr, at St Rd 2, 40/43/04N 93/56/53W, IX-11-2001 (perc). LEE: Keokuk, VII-30-1957 (isu). LUCAS: Wolf Cr, at St Rd 14, IX-11-2001 (perc). STORY: Iowa St Univ Hinds Irrigation Farm, Ames, VII-3-1988, Iowa St Univ Horticulture Farm, 5 mi N Ames, VII-11-1992 (thk). VAN BUREN: Des Moines R, at Farmington, 40/38/25N 91/44/52W, IX-10-2001 (perc).

*Remarks.*—In Iowa, this species primarily is found in lotic habitats, which in general is atypical of *Callibaetis* Eaton.

#### ***Callibaetis pallidus* Banks**

*New data.*—STORY: Ames, VII-17-1991, VIII-11-1992, IX-23-1992 (thk).

*Remarks.*—Although Klubertanz (1995) noted that this species was found in the central region of Iowa, he provided no specific data at the time.

#### ***Callibaetis pictus* (Eaton)**

*Previous data.*—Klubertanz (1995): DICKINSON (McBreen Marsh).

*Remarks.*—Iowa represents the furthest northeast record of this basically western and southwestern species.

**Camelobaetidius waltzi** McCafferty

*Previous data.*—McCafferty and Klubertanz (1994): VAN BUREN (Des Moines R).

*Remarks.*—This species remains the only member of the mainly Neotropical genus *Camelobaetidius* Demoulin that is found as far north and east as Iowa and Indiana (McCafferty and Klubertanz 1994), although it was also recently reported from Nebraska by Klubertanz and Jones (1999).

**Centroptilum victoriae** McDunnough

*New data.*—FAYETTE: Volga R, 42/50.640N 91/56.525W, IX-17-2001 (ihl).

*Remarks.*—This represents the first formal record of this species from the USA, although we have seen unreported material of this species from numerous western and eastern USA states. In Canada, it has been reported from Manitoba, Ontario, Saskatchewan, and Nova Scotia (see McCafferty and Randolph 1998).

**Centroptilum walshi** McDunnough

*Previous data.*—McDunnough (1929): [CLINTON] (Clinton). Klubertanz (1995) as *Centroptilum* sp.: [DICKINSON] (Okoboji); STORY (Ames); VAN BUREN (Lacy Keosauqua St Prk).

*Remarks.*—This is only one of three species of Ephemeroptera that were originally described from Iowa (Edmunds (1962). Klubertanz (1995) mistakenly credited Burks (1953) with the first Iowa record of this species (listed as *Procloeon walshi*); however, Burks (1953) gave no data, and because we have not found Iowa material of this species at the Illinois Natural History Survey, we conclude that Burks was alluding to the McDunnough (1929) record.

**Fallceon quilleri** (Dodds)

*Previous data.*—Lugo-Ortiz et al. (1994): STORY (Soper's Mill St Prk). Klubertanz (1995): BOONE (Des Moines R).

*New data.*—ADAIR: West Fork Middle Nodaway R, at Co Rd G61, IX-12-2001 (perc). BREMER: Cedar R, Janesville, VIII-15-1992 (thk). CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996, and West Nodaway R, 41/09/48N 94/55/42W, VIII-19-1998 (ihl). DAVIS: North Fabius R, at US Hwy 63, SW Bloomfield, and Fox R, at US Hwy 63 N Bloomfield, IX-11-2001 (perc). GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc). HAMILTON: Beaver Cr, K Young Prk, Webster City, IX-10-1991 (thk). MADISON: Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). MARSHALL: Burnett Cr, 42/04/47N 92/54/19W, VIII-22-2000 (ihl). MONONA: Soldier R, 1 mi SW Ute, at St Rd 183, IX-12-2001 (perc). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, IX-14-1999 (ihl). SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (ihl). STORY: Ames, VIII-01-1991, Iowa St Univ Hinds Irrigation Farm, Ames, VI-25-1992, South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, IX-11-1987 to VII-14-2000, South Skunk R, Soper's Mill Prk, VIII-08-1991 (thk). UNION: Platte R, at St Rd 25, IX-11-2001 (perc). VAN BUREN: Fox R at St Rd 2, IX-10-2001 (perc). WORTH: Elk Cr, 43/23/17N 93/20/26W, IX-07-2000 (ihl).

*Remarks.*—This species may be expected throughout the state, especially in low gradient streams with considerable sand/silt substrate.

**Heterocloeon frivolum** (McDunnough)

*Previous data.*—Thew (1957) as *Baetis frivulus* McDunnough: [SCOTT] (Pine Cr, Quad City area).

**Paracloeodes minutus** (Daggy)

*Previous data.*—Klubertanz (1995): STORY ([South] Skunk R).

*New data.*—DAVIS: North Fabius R, at US Hwy 63, SW Bloomfield, and Fox R,

at US Hwy 63, N Bloomfield, IX-11-2001 (perc). DECATUR: Elk Cr, at St Rd 2, 40/43/04N 93/56/53W, IX-11-2001 (perc). IOWA: Iowa R nr Marengo, 41/48/48N 92/03/51W, VIII-28-1996 (wql). LINN: Buffalo Cr, 42/12.334N 91/26.747W, VIII-29-2001 (ihl). MADISON: North Branch North R, 41/27/13N 94/04/15W, 1994-2000 (ihl). MONONA: Soldier R, 1 mi SW Ute, at St Rd 183, IX-12-2001 (perc). RINGGOLD: Walnut Cr, at SE corner of Mt Ayr Wildlife Management Area, IX-11-2001 (perc). SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (ihl). TAMA: Wolf Cr nr Dysart, 42/15/06N 92/17/55W, VIII-05-1996 (wql). UNION: Platte R, at St Rd 25, IX-11-2001 (perc). VAN BUREN: Fox R, at St Rd 2, IX-10-2001 (perc). WASHINGTON: English R, 41/28.526N 91/34.855W, IX-14-2001 (ihl).

*Remarks.*—This relatively minute mayfly was sometimes collected by us together with *F. quilleri* in low-flow, silt-bottomed streams in Iowa. Because of the small size of the larvae, a very small-mesh net or screen is required to sample it efficiently.

**Plauditus cestus** (Provonsha and McCafferty)

*Previous data.*—Klubertanz (1995) as *Barbaetis cestus* (Provonsha and McCafferty): STORY ([South] Skunk R).

*New data.*—LINN: Crabapple Cr, 42/2.114N 91/28.982W, VII-17-2001 (ihl).

**Plauditus cingulatus** (McDunnough)

*New data.*—STORY: South Skunk R, Hinds Farm, 1 mi N Ames, V-05-1988 (perc).

*Remarks.*—In the Midwest, this primarily northeastern Nearctic species, had been known only from Wisconsin (Randolph and McCafferty 1998). Iowa forms part of its westernmost known distribution.

**Plauditus dubius** (Walsh)

*Previous data.*—Klubertanz (1995) as *Baetis dubius* (Walsh): BUCHANAN (Wapsipinicon R); STORY ([South] Skunk R).

*New data.*—BLACK HAWK: West Fork Cedar R, 42/37.757N 92/32.618W, IX-14-2001 (ihl). MADISON: North Branch North R, 41/27/13N 94/04/15W, 1994-2000 (ihl). MITCHELL: Cedar R, at Spring Prk, 2 mi W Osage, IX-13-2001 (perc). O'BRIEN: Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). SCOTT: Quad City area [see Rock Island County, Illinois (Walsh 1862 as *Cloe dubia* Walsh)]. STORY: 5 mi NE Story City, attracted to light, VI-30-1991 (thk).

*Remarks.*—We have no evidence that this species still exists in the Mississippi River in the Quad City area.

**Plauditus punctiventris** (McDunnough)

*Previous data.*—Klubertanz (1995) as *Baetis punctiventris* (McDunnough): BUCHANAN (Wapsipinicon R). STORY ([South] Skunk R).

*New data.*—BOONE: Pease Cr, Ledges St Prk, V-03-1977 (isu). CEDAR: West Branch Wapsinoc Cr, at Herbert Hoover Nat. Hist. Site (csu). FAYETTE: Volga R, VI-27-1990, VII-12-1990 (isu); Volga R, 42/50.640N 91/56.525W, IX-17-2001 (ihl). HAMILTON: Beaver Cr, K Young Prk, Webster City, V-18-1992 (thk). HOWARD: Upper Iowa R, nr Cresco, IX-29-1990 (thk). MADISON: North Branch North R, 41/27/13N 94/04/15W, 1994-2000 (ihl). MITCHELL: Cedar R at Spring Prk, 2 mi W Osage, IX-13-2001 (perc). O'BRIEN: Little Waterman Cr, 43/04/45N 95/27/31W, VII-09-1996, and Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). WEBSTER: Des Moines R, Dolliver St Prk, IX-10-1991 (thk).

**Plauditus virilis** (McDunnough)

*New data.*—FRANKLIN: Maynes Cr, 42/40/69N 93/12/94W, VIII-02-1995 (perc).



**Procloeon irrubrum** Lowen and Flannagan

*Previous data.*—McCafferty and Hubbard (1998): DICKINSON (Little Sioux R); KOSSUTH (Black Cat Cr); SHELBY (West Nishnabotna R); WARREN (Whitebreast Cr); WEBSTER (Lizard Cr).

*New data.*—STORY: South Skunk R, Iowa State Univ Hinds Irrigation Farm at Ames, VII-14-2000 (thk).

**Procloeon rufostriatum** (McDunnough)

*Previous data.*—McCafferty and Hubbard (1998): WEBSTER (Lizard Cr).

*New data.*—GRUNDY: South Beaver Cr, 42/33.439N 92/49.000W, VIII-13-2001 (ihl). LINN: Buffalo Cr, 42/12.334N 91/34.855W, VIII-29-2001 (ihl).

**Procloeon viridoculare** (Berner)

*Previous data.*—McCafferty and Hubbard (1998): BUCHANAN (Bear Cr); WINNESHIEK (Canoe Cr).

*New data.*—APPANOOSE: Chariton R, at St Rd 2, E Centerville, IX-11-2001 (perc). DAVIS: Fox R, at US Hwy 63, N Bloomfield, IX-11-2001 (perc). DECATUR: Elk Cr, at St Rd 2, 40/43/04N 93/56/53W, IX-11-2001 (perc). FAYETTE: Volga R, 42/50.640N 91/56.525W, IX-17-2001 (ihl). GRUNDY: South Beaver Cr, 42/33.439N 92/49.000W, VIII-13-2001 (ihl). JONES: Buffalo Cr, 42/6.508N 91/17.930W, VIII-27-2001 (ihl). LINN: Buffalo Cr, 42/12.334N 91/34.855W, VIII-29-2001 (ihl). LUCAS: Wolf Cr, at St Rd 14, IX-11-2001 (perc). VAN BUREN: Fox R, at St Rd 2, IX-10-2001 (perc).

**Pseudocloeon dardanum** (McDunnough)

*Previous data.*—McCafferty and Hubbard (1998) as *Labiobaetis dardanus* (McDunnough): IDA (Odebolt Cr).

*New data.*—DES MOINES: Skunk R at Augusta, VIII-12-1996 (wql). FLOYD: Flood Cr nr Powersville, 42/54/26N 92/43/14W, VIII-19-1996 (wql). JOHNSON: Old Mans Cr nr Iowa City, 41/36/23N 91/36/56W, VII-29-1996 (wql). MARSHALL: Burnett Cr, 42/04/47N 92/54/19W, VIII-22-2000 (ihl). O'BRIEN: Little Waterman Cr, 43/04/45N 95/27/31W, VII-09-1996 (ihl). POTTAWATTAMIE: Missouri R, VI-10-1997 (thk) [see Douglas County, Nebraska (McCafferty et al. 2001)]. SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (IHL). TAMA: Wolf Cr nr Dysart, 42/15/06N 92/17/55W, VIII-05-1996, VIII-11-1998 (wql). WRIGHT: Iowa R nr Rowan, 42/45/36N 93/37/23W, IX-05-1996, VIII-12-1998 (wql).

**Pseudocloeon ephippiatum** (Traver)

*New data.*—JONES: Buffalo Cr, 42/6.508N 91/17.930W, VIII-27-2001 (ihl). LINN: Buffalo Cr, 42/10.550N 91/23.094W, VIII-29-2001 (ihl). WRIGHT: Iowa R nr Rowan, 42/45/36N 93/37/23W, VIII-12-1998 (wql).

**Pseudocloeon frondale** (McDunnough)

*New data.*—MITCHELL: Deer Cr, 43/25/32N 93/01/27W, VIII-21-2001 (ihl). PALO ALTO: Prairie Cr, W Whittermore, X-04-2001 (ihl).

**Pseudocloeon longipalpus** (Moriyara and McCafferty)

*Previous data.*—Klubertanz (1995) as *Baetis longipalpus* Moriyara and McCafferty: BOONE (Des Moines R); [LEE] (Keokuk).

*New data.*—DES MOINES: Burlington, VIII-19-1991 (thk); Skunk R at Augusta, VIII-12-1996 (wql). LOUISA: Iowa R at Wapello, VIII-14-1996, VIII-13-1998 (wql). MUSCATINE: Cedar R nr Conesville, 41/24/36N 91/17/06W, VII-31-1996 (wql). VAN BUREN: Des Moines R, Farmington, VIII-19-1991, VI-12-1991 (thk), and Des Moines R, at Farmington, 40/38/25N 91/44/52W, IX-10-2001 (perc), and Lacy Keosauqua St Prk, VIII-29-1992 (thk).

***Pseudocloeon propinquum* (Walsh)**

*Previous data.*—Klubertanz (1995) as *Baetis propinquus* (Walsh): [HOWARD] (Upper Iowa R); STORY ([South] Skunk R).

*New data.*—CASS: West Nodaway R, 41/09/48N 94/55/42W, VIII-19-1998 (ihl). CHICKASAW: East Fork Wapsipinicon R, 43/08/30N 92/22/26W, X-02-1995 (ihl). DAVIS: Fox R, at US Hwy 63, N Bloomfield, and North Fabius R, at US Hwy 63, SW Bloomfield, IX-11-2001 (perc). LUCAS: Wolf Cr, at St Rd 14, IX-11-2001 (perc). MADISON: Howerdon Cr, 41/21/36N 94/06/34W, VI-19-1995, and Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). MARSHALL: Burnett Cr, 42/04/47N 92/54/19W, VIII-22-2000 (ihl). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, and Little Floyd R, 43/08/41N 95/49/15W, IX-14-1999, and Little Waterman Cr, 43/04/45N 95/27/31W, VII-09-1996 (ihl). OSCEOLA: Ocheyedon R, at Co Rd A34 (csu). SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (ihl). TAMA: Wolf Cr nr Dysart, 42/15/06N 92/17/55W, VIII-11-1998 (wql). VAN BUREN: Fox R, at St Rd 2, IX-10-2001 (perc). WINNESHIEK: Chimney Rock Prk, Bluffton, and Upper Iowa R, 2 mi N Kendallville, IX-22-1991 (thk). WRIGHT: Iowa R nr Rowan, 42/45/36N 93/37/23W, VIII-12-1998 (wql).

## BAETISCIDAE

***Baetisca lacustris* McDunnough**

*Previous data.*—Pescador and Berner (1981): BOONE (Boone); DECATUR (Thompson R); DES MOINES (Hartford); FAYETTE (Mississippi R, Turkey R); STORY (East Indian Cr, [South] Skunk R). Klubertanz (1995): HOWARD (Turkey R); STORY ([South] Skunk R).

*New data.*—ALLAMAKEE: Mississippi R at Lansing, X-19-1953 (inhs). BOONE: Ledges St Prk, VI-21-1953, IV-24-1966, V-4-1966 (isu). BUTLER: Shell Rock R, Harry Woods St Prk, IV-12-1996 (csu). HAMILTON: Beaver Cr, K Young Prk, Webster City, V-18-1992 (thk). MADISON: North Branch North R, 41/27/13N 94/04/15W, 1994-2000 (ihl). UNION: Platte R, at St Rd 25, IX-11-2001 (perc). WARREN: Des Moines R at Hartford, XI-28-1953 (inhs).

***Baetisca laurentina* McDunnough**

*Previous data.*—Klubertanz (1995): HOWARD (Turkey R).

*New data.*—BREMER: Cedar R, Janesville, Rt 218, IV-12-1996 (csu). DELAWARE: Maquoketa R, Backbone St Prk, IV-13-1996 (csu).

***Baetisca obesa* (Say)**

*Previous data.*—McCafferty and Hubbard (1998): BLACK HAWK (Cedar R).

*New data.*—GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc).

## CAENIDAE

***Amercaenis ridens* (McDunnough)**

*Previous data.*—Klubertanz (1995): [LEE] (Keokuk); STORY (Ames).

*New Data.*—BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). DES MOINES: Skunk R at Augusta, VIII-12-1996 (wql). IOWA: Iowa R at Marengo, VIII-28-1996 (wql). JOHNSON: Old Mans Cr nr Iowa City, 41/36/23N 91/36/56W, VII-29-1996 (wql). MUSCATINE: Cedar R nr Conesville, 41/24/36N 91/17/06W, VII-31-1996 (wql). SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (ihl). TAMA: Wolf Cr nr Dysart, 42/15/06N 92/17/55W, VIII-05-1996 (wql).

*Remarks.*—This central states species (Provonsha and McCafferty 1985) is not known east of Iowa. Records from Illinois (Traver 1935, Burks 1953) are based on

misidentifications of *Caenis anceps* (Randolph and McCafferty 1998).

**Brachycercus lacustris** McDunnough

*New data*.—BLACK HAWK: Elk Run Cr, 42/28/15N 92/15/93W, X-15-1999 (ihl). BUCHANAN: Bear Cr, 42/06/54N 91/54/47W, VIII-08-1996 (ihl). DECATUR: Elk Cr, at St Rd 2, IX-11-2001 (perc). JASPER: Squaw Cr, 41/39/51N 93/16/23W, VIII-25-2000 (ihl). KOSSUTH: Buffalo Cr, 43/14/32N 94/05/24W, VIII-23-2000 (ihl). MADISON: North Branch North R, 41/26/79N 94/03/03W, VIII-25-1995 (ihl).

**Brachycercus nasutus** Soldán

*New data*.—GREENE: Buttrick Cr, VII-24-2001 (ihl). KOSSUTH: Buffalo Cr, 43/14/32N 93/59/17W, VIII-24-2000 (ihl). LINN: Buffalo Cr at Red Bridge, 42/15.148N 91/28.787W, VIII-30-2001 (ihl).

**Caenis amica** Hagen

*Previous data*.—Traver (1935) as *C. simulans* McDunnough: [HAMILTON] (Little Wall Lake). Provonsha (1990): DICKINSON (Lake Okoboji, West Lake Okoboji); OSCEOLA (Ocheyedan).

*New data*.—CARROLL: Middle Raccoon R, at Coon Rapids Riverside Prk, IX-12-2001 (perc). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc). MUSCATINE: Fairport, X-16-? (cu). WOODBURY: Missouri R [see Dakota County, Nebraska (Hamilton 1952, McCafferty et al. 2001)].

*Remarks*.—This species was reported by Hamilton (1952) from the Missouri River at South Sioux City, Nebraska, across from Sioux City, Iowa (Woodbury County) (see McCafferty et al. 2001).

**Caenis anceps** Traver

*Previous data*.—Provonsha (1990): LINN (Cedar Rapids).

*New data*.—DICKINSON: Iowa Lakeside Labs, Lake Okoboji, V-27-1988 (thk). FLOYD: Cedar R, W Carrville, IX-14-2001 (ihl). WINNESHIEK: Upper Iowa R, 345<sup>th</sup> St Bridge, 2 mi NE Kendallville, IX-22-1991, Chimney Rock St Prk, Bluffton, IX-22-1991 (thk).

**Caenis diminuta** Walker

*New data*.—HAMILTON: White Fox Cr, 42/32/15N 93/47/32W, V-13-1998 (ihl). LOUISA: Honey Cr, IX-02-1998 (ihl). POLK: Walnut Cr, 41/35/08N 93/43/03W, VIII-26-1998 (ihl).

*Remarks*.—Iowa and Minnesota (Provonsha 1990) represent the westernmost range limits of this species.

**Caenis hilaris** (Say)

*Previous data*.—McDunnough (1931b): STORY (Ames). Provonsha (1990): STORY (Ames).

*New data*.—BLACK HAWK: Cedar R at Gilbertville, VIII-07-1996 (wql). BREMER: Cedar R, Janesville, VII-15-1991 (thk). BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). CHEROKEE: unnamed trib West Fork Little Sioux R, nr Kingsley, no date (csu). DAVIS: Fox R, at US Hwy 63, N Bloomfield, and North Fabius R, at US Hwy 63, SW Bloomfield, IX-11-2001 (perc). FLOYD: Flood Cr nr Powersville, 42/54/26N 92/43/14W, VIII-19-1996 (wql). LEE: Keokuk, VIII-4-1958, VII-30- (isu). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc). MADISON: Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). STORY: Ames, VII-1-1949 (isu); South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, VI-20-1987 to VII-14-2000 (thk). VAN BUREN: Fox R, at St Rd 2, IX-10-2001 (perc); Des Moines R, Farmington, VIII-19-1991, VI-12-1992, Des Moines R, Lacy Keosauqua St Prk,

VIII-29-1992 (thk). WEBSTER: Des Moines R, Dolliver St Prk, IX-10-1991 (thk). WRIGHT: Iowa R nr Rowan, 42/45/36N 93/37/23W, IX-05-1996 (wql).

**Caenis latipennis** Banks

*Previous data.*—Provonsha (1990): BLACK HAWK (Cedar Falls).

*New data.*—BOONE: Ledges St Prk, VIII-15-1987 (thk); Pease Cr, Boone, V-03-1977 (isu). HAMILTON: farm pond nr Jewell, V-12-1952 (isu); quarry, 5 mi NE Story City, VI-30-1991, Little Wall Lake, VI-03-1992 (thk). LEE: Mississippi R, Fort Madison, VI-12-1992, VIII-29-1992 (thk). MADISON: North Branch North R, 41/27/13N 94/04/15W, 1994-2000 (ihl). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, and Little Floyd R, 43/08/41N 95/49/15W, IX-14-1999 (ihl). PAGE: Pierce Cr, Pierce Cr Reservoir area, 8 mi N Shenandoah, V-11-1991, and Tarkio R, St Rd 2, 8 mi E Clarinda, V-11-1991 (thk). STORY: Ames, V-19,25-1988, Iowa St Univ Hinds Irrigation Farm, Ames, VI-19-1991, VIII-05-1991, IV-29-1992, VI-15-1992, VII-14-2000 (thk). VAN BUREN: Des Moines R, Farmington, VI-12-1992 (thk). WEBSTER: Des Moines R, Dolliver St Prk, V-18-1992 (thk). WINNESHIEK: Upper Iowa R, 345<sup>th</sup> St Bridge, 2 mi NE Kendallville, IX-22-1991 (thk).

**Caenis punctata** McDunnough

*Previous data.*—Klubertanz (1995): BOONE (Des Moines R); HARRISON (Dunlap Lake); HOWARD (Turkey R); VAN BUREN (Lacy Keosauqua St Prk Lake).

*New data.*—MARION: marsh, Pella Wildlife Area, Hwy 153, VIII-29-1992 (thk).

**Caenis tardata** McDunnough

*Previous data.*—Klubertanz (1995): HAMILTON (Quarry Lake).

*New data.*—JONES: Silver Cr, 42/16.810N 91/15.817W, VIII-08-2001 (ihl).

**Caenis youngi** Roemhild

*Previous data.*—Klubertanz (1995): HAMILTON (Little Wall Lake).

**Cercobrachys** sp. 1 Sun and McCafferty

*New data.*—DES MOINES: Skunk R at Augusta, VIII-12-1996. GREENE: Buttrick Cr, 42/01/40N 94/17/58W, VIII-30-1995 (perc). HARDIN: Tipton Cr, 42/31/40N 93/23/30W, VIII-02-1999 (perc). JOHNSON: Old Mans Cr, nr Iowa City, 41/46/23N 91/36/56W, VIII-11-1997 (wql). KOSSUTH: Buffalo Cr, 43/14/32N 93/59/17W, VIII-24-2000 (perc). POWESHIEK: North Skunk R, 41/31.375N 92/40.542W, VIII-06-2001 (ihl). TAMA: Wolf Cr nr Dysart, 42/15/06N 92/17/55W, VII-22-1997 (wql). WRIGHT: Iowa R nr Rowan, 42/45/36N 91/16/40W, IX-05-1996 (wql).

*Remarks.*—This species is also found in Indiana, Nebraska, and Wisconsin. It is being formally described elsewhere.

**Cercobrachys** sp. 2 Sun and McCafferty

*New data.*—ADAIR: West Fork Middle Nodaway R, at Co Rd G61, IX-12-2001 (perc). DES MOINES: Skunk R at Augusta, VIII-12-1996. JASPER: North Skunk R, 41/39.087N 92/49.496W, VIII-06-2001 (ihl). JOHNSON: Old Mans Cr, nr Iowa City, 41/46/23N 91/36/56W, VIII-11-1997 (wql). MONONA: Soldier R, 1 mi SW Ute, at St Rd 183, IX-12-2001 (perc). TAMA: Richland Cr, 41.899N 92.475W, IX-08-1995 (perc). VAN BUREN: Fox R, at St Rd 2, IX-10-2001 (perc).

*Remarks.*—In addition to the above localities in Iowa, this species is also known from Nebraska, Texas, and Wisconsin. It is being described elsewhere.

## EPHEMERELLIDAE

**Dannella lita** (Burks)

*New data*.—ALLAMAKEY: Yellow R, 43/06/71N 91/15/89W, Upper Iowa R, 43/25/51N 91/33/41W, V-16-2000 (ihl).

*Remarks*.—Iowa together with Missouri (Sarver and Kondratieff 1997) represent the westernmost limits of this species in the United States. A western disjunct record of *D. lita* in Saskatchewan (Lehmkuhl 1976) may prove to be attributable to the more northern widespread but closely related *D. simplex* (McDunnough).

**Ephemerella excrucians** Walsh

*New data*.—SCOTT: Quad City area [see Rock Island County, Illinois (Walsh 1862, Randolph and McCafferty 1998)].

*Remarks*.—It may be extrapolated from the 1862 Rock Island, Illinois type locality record of this species that its historical occurrence included areas common to both sides of the Mississippi River in the Quad City area. There is no current evidence that the species still exists in either Iowa or western or northern Illinois; however, it is known from other localities in the Midwest, including Mount Carmel, Illinois on the Indiana-Illinois border (reported under the synonym *E. ora* Burks) (see Randolph and McCafferty 1998, McCafferty 2001).

**Ephemerella inermis** Eaton

*Previous data*.—Klubertanz (1995) misidentified as *E. invaria* (Walker); WINNESHIEK (Spring Run).

*New data*.—ALLAMAKEY: Cota Cr, 43/12/79N 91/08/90W, VI-19-2000, Yellow R, 43/09/63N 91/09/63W, VIII-16-2000 (ihl). CLAYTON: Big Spring Run, 42/45/41N 91/31/28W, V-08-2001, and Sny-Magill Cr, 1992-2001, and Bloody Run, 1992-2001 (ihl). DELAWARE: Ram Hollow Spring, 42/37/66N 91/09/70W, VI-19-2000 (ihl). WINNESHIEK: South Bear Cr, at Co Rd A24, 2.5 mi E Highlandville, IX-13-2001 (perc); Trout R, 43/15/15N 91/40/52W, VII-1996 (ihl).

*Remarks*.—This species is disjunctly distributed from the Rocky Mountains (see e.g., McCafferty et al. 1993) through Nebraska (McCafferty et al. 2001), South Dakota (McCafferty 1990), and Iowa to Wisconsin (Randolph and McCafferty 1998).

**Ephemerella needhami** McDunnough

*New data*.—BUCHANAN: Lime Cr, 42/19/86N 91/58/75W, V-12-1998 (ihl). HAMILTON: White Fox Cr, 42/32/15N 93/47/32W, VI-13-1995 (ihl). JACKSON: North Fork of Maquoketa R, 42/08/70N 90/41/00W, V-03-2000 (ihl). TAMA: Iowa R, 41/57/33N 92/35/83W, V-02-1996 (ihl).

*Remarks*.—This represents the westernmost North American record of this common eastern and midwestern species. Randolph and McCafferty (1998) noted that *E. needhami* was the most common ephemereleid in the central lowlands of Illinois, Indiana, and Ohio and could be found in generally good quality streams having filamentous algae, with which it is ecologically associated (see also McShaffrey and McCafferty 1991).

**Ephemerella subvaria** McDunnough

*New data*.—ALLAMAKEY: Waterloo Cr, nr Dorchester & Hwy 76, 42/26/13N 91/30/40W, IV-02-2002 (ihl).

*Remarks*.—Iowa along with Minnesota and Missouri represent the westernmost range of this species in the USA.

**Serratella molita** (McDunnough)

*New data*.—TAMA: Iowa R, 41/95/30N 92/57/70W, V-02-1996 (ihl).

*Remarks*.—This species [formerly also known as *S. serratooides* (McDunnough) (see Jacobus and McCafferty 2002b)] finds its furthest western records in Arkansas

(McCafferty and Provonsha 1978), Missouri (Sarver and Kondratieff 1997), and Iowa.

## EPHEMERIDAE

**Ephemera simulans** Walker

*New data*.—DES MOINES: Skunk R at Augusta, VIII-12-1996 (wql). MUSCATINE: Cedar R nr Conesville, 41/24/36N 91/17/06W, VII-31-1996 (wql).

**Hexagenia atrocaudata** McDunnough

*Previous data*.—Klubertanz (1995): VAN BUREN (Lacy Keosauqua St Prk Lake).

*New data*.—FAYETTE: Volga R at Twin Bridges, 42/49.153N 91/53.120W, IX-18-2001 (ihl). JONES: Buffalo Cr, 42/6.508N 92/32.618W, VIII-30-2001 (ihl). WRIGHT: Iowa R nr Rowan, 42/45/36N 93/37/23W, IX-05-1996 (wql).

*Remarks*.—Iowa along with Missouri records represent the westernmost North American distribution of this species (McCafferty 1975).

**Hexagenia bilineata** (Say)

*Previous data*.—Traver (1931): LEE (Keokuk). Traver (1935): MUSCATINE (Fairport). Spieth (1941): DES MOINES (Burlington); DUBUQUE (Dubuque); MUSCATINE (Fairport, Muscatine); SCOTT (Pleasant Valley). Thew (1956): [DES MOINES] (Burlington); [SCOTT] (Bettendorf, Buffalo, Davenport, Pleasant Valley). Hamilton (1959): BUTLER; DES MOINES (Burlington); HENRY (Mount Pleasant); LEE; MUSCATINE (Muscatine); SCOTT (LeClaire). Gooch (1967): LEE (Mississippi R.). Fremling (1970): LEE (Mississippi R.).

*New data*.—BLACK HAWK: Cedar Falls, VIII-03,23-1973 (perc). LEE: Mississippi R, Fort Madison, VI-12-1992, VIII-29-1992 (thk). MUSCATINE: Pleasant Valley, VII-05-1928 (cu). STORY: Iowa St Univ Hinds Irrigation Farm, Ames, VII-22-1991 (thk).

*Remarks*.—Traver (1935) cited Andalusia and Chute as locales for this species in Iowa. We cannot confirm such locations in Iowa. There is, however, an Andalusia, Illinois just across the Mississippi River from Buffalo, Iowa (Scott County). The nearest Chute apparently is in Wisconsin.

**Hexagenia limbata** (Serville)

*Previous data*.—Hendrickson (1930) as *H. venusta* Eaton: [IOWA] (Lake Amana). Traver (1935) as *H. venusta*: STORY (Ames). Spieth (1941): IOWA. Spieth (1941) as *H. munda* Eaton: IOWA. Thew (1956): [DICKINSON] (Arnold's Park, Spirit Lake); [MUSCATINE] (Muscatine); [SCOTT] (Bettendorf, Buffalo, Davenport, McCausland, Mississippi R, Pleasant Valley). Thew (1956) as *H. venusta* Eaton: [DICKINSON] (Arnold's Park, Spirit Lake); [SCOTT] (Bettendorf). Hamilton (1959): CLAY; CLAYTON; DAVIS; DICKINSON; EMMET; FLOYD (Charles City); FRANKLIN (Hampton); HENRY (Mount Pleasant); IOWA (Lake Amana); LEE (Mississippi R); LINN; LYON (Beloit); MUSCATINE (Muscatine); PLYMOUTH; STORY (Ames). Hamilton (1959) as *H. munda* Eaton: DELAWARE; LINN. Gooch (1967): LEE (Mississippi R).

*New data*.—CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996 (ihl). CHICKASAW: East Fork Wapsipinicon R, 43/08/30N 92/22/26W, X-02-1995, and Wapsipinicon R, 43/00/40N 92/23/20W, IX-06-1994 (ihl). CLARKE: South Whitebreast Cr, 40/57/57N 93/36/43W, IX-28-1995 (ihl). DECATUR: Elk Cr, at St Rd 2, 40/43/04N 93/56/53W, IX-11-2001 (perc). HAMILTON: Beaver Cr, K Young Prk, Webster City, IX-10-1991 (thk). LEE: Skunk R, at US Hwy 61, 41/43/33N 91/12/46W, IX-10-2001 (perc); Mississippi R, Fort Madison, VI-12-1992 (thk). LUCAS: Wolf Cr, at St Rd 14, IX-11-2001 (perc). MILLS: Council Bluffs at light, VI-18-1984 (perc). MONONA: Soldier R, 1 mi SW Ute at St Rd 183, IX-12-2001 (perc). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, and Little Floyd R, 43/08/41N 95/

49/15W, IX-14-1999, and Little Waterman Cr, 43/04/45N 95/27/31W, VII-09-1996, and Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). OSCEOLA: Ocheyedan R, at Co Rd A34 (csu). STORY, Ames, VIII-03-1953 (perc). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl). WORTH: Elk Cr, 43/23/17N 93/20/26W, IX-07-2000, and Willow Cr, 43/16/36N 93/21/31W, VIII-17-1995 (ihl).

**Hexagenia rigida** McDunnough

*Previous data.*—Traver (1935) MUSCATINE (Fairport). Spieth (1941): MUSCATINE (Fairport).

**Pentagenia vittigera** (Walsh)

*Previous data.*—Needham (1920) as *P. quadripunctata* Walsh: [DES MOINES (Burlington)]; [LEE] (Fort Madison, Keokuk); [MUSCATINE] (Fairport). Traver (1935): MUSCATINE (Fairport, Muscatine). Thew (1956): [SCOTT] (Buffalo, Davenport). Hamilton (1959): CLINTON (Clinton); DES MOINES (Burlington); DICKINSON; HENRY (Mount Pleasant); MUSCATINE; VAN BUREN (Keosauqua); WASHINGTON. Carlson (1968): LEE (Mississippi R).

*New data.*—CLAY: Peterson, VII-26-1987 (perc). DES MOINES: Burlington, VIII-29-1938, VI-10,11-1939 (inhs). JACKSON: Mississippi R at Sabula, VIII-06-1946 (inhs). LEE: Mississippi R, Keokuk, V-30-1987 (thk). PAGE: Shenandoah, VII-09-1963 (isu). STORY: South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, IX-19-1987, VI-12-1991, II-28-1992, VI-15-1992 (thk); Ames, VIII-11-1991 (isu), VII-16-1987 (thk); South Skunk R, Soper's Mill Prk, VII-11-1992 (thk). VAN BUREN: Des Moines R, Farmington, VI-12-1992, Lacy Keosauqua St Prk, VIII-29-1992 (thk). WEBSTER: Des Moines R, Dolliver St Prk, V-18-1992 (thk).

HEPTAGENIIDAE

**Anepeorus simplex** (Walsh)

*Previous data.*—McDunnough (1929): [SCOTT] (Davenport).

*Remarks.*—The Iowa record of this infrequently collected species was based on adults (McDunnough 1929). The species was originally described from Rock Island, Illinois, across the Mississippi River from Davenport (Walsh 1863). Larvae of *A. simplex* therefore can be assumed to have been developing in the Mississippi River. *Anepeorus simplex* is among the most difficult-to-collect mayflies in North America due to its larval habitats in large, sandy bottomed rivers (McCafferty and Provonsha 1985, McCafferty 1991, Randolph and McCafferty 1998). In addition to the single record from Iowa, it is also known from Indiana, Wisconsin, Georgia, and South Carolina.

**Heptagenia diabasias** Burks

*Previous data.*—Daggy (1945) misidentified as *Heptagenia elegantula* (Eaton): [ALLAMAKEE] (Winnebago Cr). Burks (1946): [CRAWFORD] (Denison); [MONTGOMERY] (Red Oak). Thew (1956): [CALHOUN] (Farnhamville); [CLINTON] (Clinton); [MUSCATINE] (Pine Cr); [SCOTT] (Pleasant Valley); [SAC] (Auburn); [STORY] (Ames); [WEBSTER] (Des Moines R).

*New data.*—ADAIR: West Fork Middle Nodaway R, at Co Rd G61, IX-12-2001 (perc). AUDUBON: Troublesome Cr, at Co Rd F58, IX-12-2001 (perc). BOONE: Des Moines R, Ledges St Prk, V-2-1957, IX-30-1969, IX-16-1974 (isu). BREMER: Cedar R, Janesville, VII-15-1991 (thk). CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996, and West Nodaway R, 41/09/48N 94/55/42W, VIII-19-1998 (ihl). CEDAR: West Branch Wapsinoc Cr, at Herbert Hoover Nat. Hist. Site (csu). CHEROKEE: unnamed trib West Fork Little Sioux R, nr Kingsley (csu). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994, and Wapsipinicon R, 43/00/40N 92/23/

20W, IX-06-1994 (ihl). DAVIS: North Fabius R at US Hwy 63, SW Bloomfield, and Fox R, at US Hwy 63, N Bloomfield, IX-11-2001 (perc). FRANKLIN: Beeds Lake St Prk, VII-15-1991 (thk). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc). HAMILTON: quarry, 5 mi NE Story City, VII-03-1991 (thk). LEE: Mississippi R, Fort Madison, VI-12-1992 (thk). MADISON: Howerdon Cr, 41/21/36N 94/06/34W, VI-19-1995 (ihl). MARSHALL: Burnett Cr, 42/04/47N 92/54/19W, VIII-22-2000 (ihl). MILLS: Council Bluffs, at light, VI-18-1984 (perc). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, and Little Floyd R, 43/08/41N 95/49/15W, IX-14-1999, and Little Waterman Cr, 43/04/45N 95/27/31W, VII-09-1996, and Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). OSCEOLA: Ochevedan R, at Co Rd A34 (csu). PAGE: Tarkio R, St Rd 2, 8 mi E Clarinda, V-11-1991 (thk). POTTAWATTAMIE: W Nishnabotna R, at US Hwy 59, 2 mi S Avoca, V-11-1991 (thk); Missouri R [see Douglas County, Nebraska (McCafferty et al. 2001)]. SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (ihl). STORY: South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, VI-20-1987, VII-14-2000; South Skunk R, Soper's Mill Prk, VI-20-1991 (thk). VAN BUREN: Fox R, at St Rd 2, IX-10-2001 (perc). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl). WORTH: Willow Cr, 43/16/36N 93/21/31W, VIII-17-1995 (ihl).

*Remarks.*—According to Bednarik and Edmunds (1980), larvae from northern Iowa and Minnesota that Daggy (1945) described as *H. elegantula* are referable to *H. diabasia*. This species is expected to be common throughout Iowa.

#### **Heptagenia flavescens** (Walsh)

*Previous data.*—Traver (1935): [MUSCATINE] (Fairport).

*New data.*—APPANOOSE: Chariton R at St Rd 2, E Centerville, IX-11-2001 (perc). BOONE: Des Moines R, Ledges St Prk, VI-26-1963 (isu). BREMER: Cedar R, Janesville, VII-15-1991 (thk). BUCHANAN: Wapsipinicon R, Otterville Wildlife Prk, V-08-1992 (thk). BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). CHICKASAW: Wapsipinicon R, 43/00/40N 92/23/20W, IX-06-1994 (ihl). DES MOINES: Mississippi R, Fort Madison, VI-12-1992, and Skunk R, nr Wever, VIII-19-1991 (thk). LEE: Mississippi R, Fort Madison, VI-12-1992, Skunk R, nr Wever, VIII-19-1991 (thk). MADISON: Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). MILLS: Council Bluffs, at light, VI-18-1984 (perc). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). SCOTT: Quad City area [see Rock Island County, Illinois (Walsh 1862 as *Palingenia flavescens* Walsh)]. STORY: Ames, V-22-1991, Iowa St Univ Hinds Irrigation Farm, Ames, VI-12-1991 (thk). VAN BUREN: Des Moines R, Lacy Keosauqua St Prk, VIII-29-1992 (thk). WAPELLO: Des Moines R, Great Eagle St Prk, 1 mi SE Ottumwa, VI-12-1992 (thk). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl). WINNESHIEK: Upper Iowa R, Kendallville, IX-22-1991 (thk).

*Remarks.*—The Skunk River near Wever, as reported above, forms the border between, and therefore is common to, Des Moines and Lee Counties. The species is expected to occur throughout Iowa.

#### **Heptagenia pulla** (Clemens)

*New data.*—CHICKASAW: Wapsipinicon R, 43/00/40N 92/23/20W, IX-06-1994 (ihl). JOHNSON: Old Man's Cr, 41/60/40N 91/71/00W, VIII-03-1994 (ihl). MADISON: North Branch North R, 41/27/13N 94/04/15W, 1994-2000 (ihl).

#### **Leucrocuta hebe** (McDunnough)

*Previous data.*—Traver (1935) as *Heptagenia hebe* McDunnough: [MUSCATINE] (Fairport). Thew (1956) as *Heptagenia hebe* McDunnough: [SCOTT] (Bettendorf).

*New data.*—JASPER: North Skunk R, 41/39.087N 92/40.542W, VIII-06-2001 (ihl). MADISON: North Branch North R, 41/27/13N 94/04/15W, 1994-2000 (ihl).



**Leucrocuta juno** (McDunnough)

*Previous data.*—McCafferty and Hubbard (1998): STORY (Ames).

*Remarks.*—Randolph and McCafferty (1998) had mistakenly indicated that this species had been reported from Iowa by Klubertanz (1995).

**Leucrocuta maculipennis** (Walsh)

*Previous data.*—Thew (1956) as *Heptagenia maculipennis* Walsh: [MUSCATINE] (Muscatine). Klubertanz (1995): [LEE] (Keokuk); STORY (Ames).

*New data.*—BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc). MONTGOMERY: Red Oak, VII-28-1946 (inhs). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). POWESHIEK: North Skunk R, 41/31.375N 92/40.542W, VIII-05-2001 (ihl). SCOTT: Quad City area [see Rock Island County, Illinois (Walsh 1863 as *Heptagenia maculipennis* Walsh)].

*Remarks.*—The extrapolation that this species occurred in the Mississippi River between Davenport, Iowa and Rock Island, Illinois (Walsh 1863) receives support from its later record from nearby Muscatine, Iowa (Thew 1956) and its further discovery at Keokuk further south on the Mississippi River (Klubertanz 1995).

**Macdunnoa persimplex** (McDunnough)

*Previous data.*—McDunnough (1929) as *Heptagenia persimplex* McDunnough: [CLINTON] (Clinton); [SCOTT] (Pleasant Valley); STORY (Ames).

*Remarks.*—Klubertanz (1995) mistakenly credited Burks (1953) with the first Iowa record of this species. Burks (1953), however, merely listed Iowa without data under the distribution of the species, and because we cannot find any Iowa material of this species in the Illinois Natural History Survey, Burks (1953) must have been alluding to the McDunnough (1929) Iowa records. *Macdunnoa persimplex* is one of only three species of mayflies that were originally described from Iowa (Edmunds 1962).

**Nixe inconspicua** (McDunnough)

*New data.*—BOONE: Beaver Cr, 42/02/24N 94/08/75W, VIII-10-1994 (ihl). DALLAS: Little Beaver Cr, VII-12-1994 (ihl). FAYETTE: North Branch Volga River, 42/50.846N 91/55.038W, IX-18-2001 (ihl). GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc).

*Remarks.*—Iowa along with Arkansas (McCafferty 1977) and far eastern Oklahoma (McCafferty et al. 1997) in the United States, and Saskatchewan in Canada (Whiting and Sheard 1990), represent the westernmost distributional limits of this species.

**Nixe perfida** (McDunnough)

*New data.*—CHEROKEE: Little Maple R, 4.5 mi E Galva, 42/34/37N 95/25/58W, VIII-06-1997 (ihl).

**Nixe rusticalis** (McDunnough)

*Previous data.*—Klubertanz (1995): STORY ([South] Skunk R).

*Remarks.*—Iowa represents the westernmost distribution of this species in the USA (see Randolph and McCafferty 1998).

**Raptoheptagenia cruentata** (McDunnough)

*Previous data.*—McDunnough (1929) as *Heptagenia cruentata* Walsh, 1863: [SCOTT] (Davenport).

*New data.*—POTTAWATTAMIE: Missouri R [see Douglas County, Nebraska (McCafferty et al. 2001)].

*Remarks.*—Walsh (1863) described this species from Rock Island, Illinois, and it undoubtedly developed in the Mississippi River where it is common to both Iowa and Illinois. Later, it was found in Davenport on the Iowa side of the river (McDunnough 1929). McCafferty et al. (2001) reported this species from the Missouri River, Dodge County, Nebraska (Dodge Park, Omaha). Here, the Missouri River forms the border between Iowa and Nebraska. Clearly the larvae would develop in the big river habitat provided by the Missouri River (see below). Klubertanz (1995) credited Burks (1953) with a record from Iowa for *R. cruentata*; however, Burks (1953) only mentioned distributions in Illinois, Manitoba, and Nebraska. Randolph and McCafferty (1998) indicated additional records in Indiana, Kentucky, Ohio, and Saskatchewan. The earliest record of this species from the Mississippi River area by McDunnough (1929) is predictive because of the big river habitat associated with the larvae (see Whiting and Lehmkuhl 1987).

### **Rhithrogena jejuna** Eaton

*Previous data.*—McCafferty and Hubbard (1998): WINNESHIEK (Upper Iowa R).

*Remarks.*—Randolph and McCafferty (1998) noted that this was a primarily eastern species that in the Midwest is found mainly in the Superior Uplands. It has also been found in the Oklahoma Ozarks (McCafferty et al. 1997). Thus it is not too surprising that this species is found in summer-cool, Iowa trout-stream-like habitats found in Winneshiek County near the Minnesota and Wisconsin borders. See also *Ephemerella inermis* and *E. subvaria* (above) and *R. manifesta* Eaton (below) in this regard also.

### **Rhithrogena manifesta** Eaton

*Previous data.*—Klubertanz (1995) as *R. pellucida* Daggy: BOONE (Des Moines R); [WINNESHIEK] (Upper Iowa R).

*New data.*—LINN: Buffalo Cr at Red Bridge, 42/15.148N 91/28.787W, VIII-30-2001 (ihl).

*Remarks.*—This species, which was only recently reinstated by Jacobus and McCafferty (2002a), is the most common and widespread *Rhithrogena* Eaton of the lower midwestern states (Randolph and McCafferty 1998).

### **Stenacron candidum** (Traver)

*Previous data.*—McCafferty and Hubbard (1998): BLACKHAWK (Cedar Falls).

*New data.*—TAMA: Wolf Cr nr Dysart, 42/15/06N 92/17/55W, VIII-11-1998 (wql).

*Remarks.*—Iowa and further north Minnesota (Lager et al. 1982) represent the westernmost records of this species in North America (Randolph and McCafferty 1998).

### **Stenacron carolina** (Banks)

*Previous data.*—McCafferty and Hubbard (1998): BLACKHAWK (Cedar Falls).

*Remarks.*—This species is known from north to south in the Appalachians, and in the Midwest it has also been known from Ohio and Indiana (Randolph and McCafferty 1998). Iowa represents the westernmost distribution of *S. carolina* in North America.

### **Stenacron interpunctatum** (Say)

*Previous data.*—Thew (1956) as *Stenonema canadense* (Walker) [SCOTT] (Buffalo, Davenport). Thew (1956) as *Stenonema*: [SCOTT] (Bettendorf).

*New data.*—ALLAMAKEY: Yellow R, Mountain Maple Hollow Preserve, 5 mi NE Postville, VII-27-1991 (thk). APPANOOSE: Chariton R, at St Rd 2, E Centerville, IX-11-2001 (perc). AUDUBON: Troublesome Cr, at Co Rd F58, IX-12-2001 (perc). BOONE: Ledges St Prk, IX-30-1969 (isu); Des Moines R, Ledges St Prk, VIII-15-1987

(thk). BUCHANAN: Wapsipinicon R, Otterville Wildlife Prk, V-08-1992 (thk). BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). CARROLL: Middle Raccoon R, at Coon Rapids Riverside Prk, IX-12-2001 (perc). CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996, and West Nodaway R, 41/09/48N 94/55/42W, VIII-19-1998 (ihl). CHEROKEE: unnamed trib West Fork Little Sioux R, nr Kingsley (csu). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994, and East Fork Wapsipinicon R, 43/08/30N 92/22/26W, X-02-1995 (ihl). CLARKE: South Whitebreast Cr, 40/57/57N 93/36/43W, IX-28-1995 (ihl). DICKINSON: Lake Okoboji, Iowa Lakeside Labs, V-27-1988 (thk). FRANKLIN: Beeds Lake Prk, VII-15-1991 (thk). GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc); Middle Raccoon R, SE Robinson Wildlife Area, V-11-1991 (thk). HAMILTON: Beaver Cr, K Young Prk, Webster City, IX-10-1991 (thk). HOWARD: Turkey R, 5 mi S Cresco, IX-21-1991 (thk). LEE: Skunk R, at US Hwy 61, 40/43/33N 91/12/46W, IX-10-2001 (perc); Keokuk, VII-03-1957 to VII-10-1958 (isu); Mississippi R, Fort Madison, VIII-29-1992 (thk). LUCAS: Wolf Cr, at St Rd 14, IX-11-2001 (perc). MADISON: Howerdon Cr, 41/21/36N 94/06/34W, VI-19-1995 (ihl). MARSHALL: Burnett Cr, 42/04/47N 92/54/19W, VIII-22-2000 (ihl). MITCHELL: Cedar R at Spring Prk, 2 mi W Osage, IX-13-2001 (perc). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, and Little Floyd R, 43/08/41N 95/49/15W, IX-14-1999, and Little Waterman Cr, 43/04/45N 95/27/31W, VII-09-1996 (ihl). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). POCAHONTAS: Big Cedar Cr, N Laurens, IX-13-2001 (perc). RINGGOLD: Walnut Cr, at SE corner of Mt. Ayr Wildlife Management Area, IX-11-2001 (perc). SIOUX: Six Mile Cr, 42/58/06N 96/27/09W, VIII-02-2000 (ihl). STORY: Ames, V-25-1988, VI-12-1991, and Iowa St Univ Hinds Irrigation Farm, Ames, VI-06-1988 to VI-15-1992, and South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, IX-03-1988 to VI-22-1992, and South Skunk R, Soper's Mill Prk, VI-20-1991 (thk). TAYLOR: Lake of Three Fires St Prk, V-11-1991 (thk). VAN BUREN: Des Moines R, Farmington, VI-12-1992 (thk). WEBSTER: Des Moines R, Dolliver St Prk, V-18-1992 (thk). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl). WINNESHIEK: South Bear Cr, at Co Rd A24, 2.5 mi E Highlandville, and North Bear Cr, off Co Rd A24, 3 mi E Highlandville, above confluence with South Bear Cr, IX-13-2001 (perc). WORTH: Willow Cr, 43/16/36N 93/21/31W, VIII-17-1995 (ihl).

*Remarks.*—Klubertanz (1995) listed this species from all regions within Iowa, but gave no actual data at the time. He also mistakenly credited Burks (1953) with the first record of *S. interpunctatum* from Iowa. Burks, however, gave no data or indication of his information source, and we have not found Iowa specimens of this common species in the Illinois Natural History Survey. This relatively ubiquitous species should be found in all counties of Iowa.

#### ***Stenonema exiguum* Traver**

*Previous data.*—Klubertanz (1995): BREMER (Cedar R); [DES MOINES/LEE] (Skunk R); STORY ([South] Skunk R).

*New data.*—APPANOOSE: Chariton R, at St Rd 2, E Centerville, IX-11-2001 (perc). BOONE: Ledges St Prk, IX-24-1954 (isu). BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). CASS: West Nodaway R, 41/09/48N 94/55/42W, VIII-19-1998 (ihl). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994, and Wapsipinicon R, 43/00/40N 92/23/20W, IX-06-1994 (ihl). GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off St Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). HAMILTON: Beaver Cr, K Young Prk, Webster City, IX-10-1991 (thk). MADISON: Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). MILLS: Council Bluffs at light, VI-18-1984 (perc). MITCHELL: Cedar R at Spring Prk, 2 mi W Osage, IX-13-2001 (perc). PALO ALTO: West Fork Des Moines R, at

Co Rd B55, IX-13-2001 (perc). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl). WORTH: Elk Cr, 43/23/17N 93/20/26W, IX-07-2000 (ihl).

*Remarks.*—Although Bednarik and McCafferty (1979) included most of Iowa in their range map of this species, they did not provide actual Iowa records. It was recorded from as far west as East Texas in the South and Minnesota in the North; thus it also finds its westernmost distribution in Iowa.

### ***Stenonema femoratum* (Say)**

*Previous data.*—Traver (1935) as *S. tripunctatum* (Banks): [JOHNSON] (Iowa City). Thew (1956): [DICKINSON] (Arnold's Park). Thew (1956) as *S. tripunctatum* (Banks): [JOHNSON] (Iowa City); [SCOTT] (Bettendorf). Bednarik and McCafferty (1979): [DICKINSON] (West Okoboji Lake).

*New data.*—BUTLER: NW Cedar Falls, VIII-18-1969 (isu). HOWARD: Turkey R, 5 mi S Cresco, IX-21-1991 (thk). DUBUQUE: White Pine Hollow, South stream, IV-18-2001 (ihl).

### ***Stenonema luteum* (Clemens)**

*Previous data.*—Klubertanz (1995): STORY ([South] Skunk R).

*Remarks.* The single male adult that this record is based on will key to *S. luteum* in Bednarik and McCafferty (1979). It is often easy to confuse this species in the adult stage with *S. terminatum* (see below), and habitat available in the South Skunk River are more typical of *S. terminatum* than they are of the large-river habitat indicated by Bednarik and McCafferty (1979) for *S. luteum*. *Stenonema luteum*, however, has recently been reported from smaller stream habitats in New York by Jacobus and McCafferty (2001).

### ***Stenonema mediopunctatum* (McDunnough)**

*Previous data.*—Klubertanz (1995): [HOWARD] (Upper Iowa R).

*New data.*—ALLAMAKEE: Yellow R, 43/06/47N 91/14/01W, IX-29-1998 (ihl). BUCHANAN: Lime Cr, 42/19/45N 91/58/55W, V-12-1998 (ihl). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994 (ihl). CLAYTON: Bloody Run Cr, 43/02/09N 91/16/04W, X-14-1994 (ihl). DUBUQUE: Little Maquoketa R, 42/30/58N 90/50/01W, IX-21-1995 (ihl). FAYETTE: Volga R, 42/49/09N 91/53/04W, IX-20-95 (ihl). FLOYD: Little Cedar R, 43/09//08N 92/38/37W, X-03-1995 (ihl). LINN: West Otter Cr, 42/07/55N 91/43/03W, X-23-2001 (ihl). MITCHELL: Burr Oak Cr, 43/19/21N 92/44/09W, VIII-14-1995 (ihl). WINNESHIEK: Upper Iowa R, Kendallville, IX-22-1991 (thk); Canoe Cr, 43/22/01N 91/37/05W, IX-09-1997 (ihl). WORTH: Willow Cr, 43/16/36N 93/21/31W, VIII-17-1995 (ihl).

*Remarks.*—Although Bednarik and McCafferty (1979) included Iowa in their range map of this species, they did not provide any actual Iowa data. *Stenonema mediopunctatum* ranges somewhat farther west than Iowa in both South Dakota and Oklahoma and is common throughout the eastern half of North America (Bednarik and McCafferty 1979).

### ***Stenonema mexicanum* (Ulmer)**

*Previous data.*—Thew (1956) as *S. metriotes* Burks: [SCOTT] (LeClaire). Bednarik and McCafferty (1979) as *S. integrum* (McDunnough): BLACK HAWK (Cedar Falls).

*New data.*—APPANOOSE: Chariton R, at St Rd 2, E Centerville, IX-11-2001 (perc). BOONE: Des Moines R, Ledges St Prk, X-10-1957 to VII-07-1965 (isu). BREMER: Cedar R, Janesville, VII-15-1991 (thk). BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996 (ihl). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994 (ihl). DES MOINES: Burlington, VI-11-1939 (inhs); Mississippi R, Burlington, VIII-19-1991, and Skunk R, nr Wever, VIII-19-1991 (thk). GUTHRIE: Middle Raccoon R,

SE Robinson Wildlife Area, V-11-1991 (thk). HAMILTON: Rock quarry, 5 mi NE Story City, VI-30-1991 (thk). LEE: Keokuk, VI-19,28-1958, VII-10-1958 (isu); Skunk R, at US Hwy 61, 40/43/33N 91/12/46W, IX-10-2001 (perc); Mississippi R, Fort Madison, and Skunk R, nr Wever, VIII-19-1991 (thk). MADISON: Howerdon Cr, 41/21/36N 94/06/34W, VI-19-1995, and Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). POTTAWATTAMIE: Missouri R [see Douglas County, Nebraska (McCafferty et al. 2001)]. STORY: Iowa St Univ Hinds Irrigation Farm, Ames, VI-16-1988 to VIII-10-1991, and South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, VII-14-2000, and South Skunk R, Soper's Mill Prk, VIII-08-1991 (thk). VAN BUREN: Des Moines R, at Farmington, 40/38/25N 91/44/52W, IX-10-2001 (perc); Des Moines R, Farmington, VIII-19-1991, VI-12-1992, and Des Moines R, Lacy Keosauqua St Prk, VIII-29-1992 (thk). WAPELLO: Des Moines R, Great Eagle St Prk, 1 mi SE Ottumwa, VI-12-1992 (thk). WEBSTER: Des Moines R, Dolliver St Prk, V-18-1992 (thk). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl).

*Remarks.*—The Skunk River near Wever, as reported above, forms the border between, and therefore is common to, Des Moines and Lee Counties. This species along with *S. terminatum* (see below) are apparently the most common of *Stenonema* in Iowa; they are expected to occur throughout the state.

#### ***Stenonema modestum* (Banks)**

*Previous data.*—Klubertanz (1995): FAYETTE (Volga R).

*Remarks.*—Bednarik and McCafferty (1979) showed the range of this species extending westward in Iowa and Minnesota; however, they gave no substantiating data. Iowa currently represents the westernmost range limits of *S. modestum*.

#### ***Stenonema pulchellum* (Walsh)**

*Previous data.*—Traver (1935): [SCOTT] (Pleasant Valley). Thew (1956): [SCOTT] (Bettendorf, Davenport, Pleasant Valley). Bednarik and McCafferty (1979): BLACK HAWK (Cedar Falls); [SCOTT] (Davenport, Pleasant Valley).

*New data.*—APPANOOSE: Chariton R, at St Rd 2, E Centerville, IX-11-2001 (perc). BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994 (ihl). DAVIS: Fox R, at US Hwy 63, N Bloomfield, IX-11-2001 (perc). MITCHELL: Cedar R at Spring Prk, 2 mi W Osage, IX-13-2001 (perc). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl).

#### ***Stenonema terminatum* (Walsh)**

*Previous data.*—Thew (1956): [SCOTT] (Davenport). Thew (1956) as *S. bipunctatum* (McDunnough): [MUSCATINE] (Muscatine); [SCOTT] (Buffalo, Davenport, Pleasant Valley). Bednarik and McCafferty (1979): BLACK HAWK (Cedar Falls); STORY (Ames).

*New data.*—BOONE: Ledges St Prk, V-17-1964, IX-21-1964, Des Moines R, Ledges St Prk, X-10-1957 to V-10-1967 (isu). BREMER: Cedar R, Janesville, VII-15-1991 (thk). BUCHANAN: Wapsipinicon R, Otterville Wildlife Prk, V-08-1992 (thk). CASS: Indian Cr, 41/19/06N 95/07/43W, X-15-1996, and West Nodaway R, 41/09/48N 94/55/42W, VIII-19-1998 (ihl). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-07-1994, and East Fork Wapsipinicon R, 43/08/30N 92/22/26W, X-02-1995, and Wapsipinicon R, 43/00/40N 92/23/20W, IX-06-1994 (ihl). CLAY: Peterson, VII-26-1987 (perc). GUTHRIE: Middle Raccoon R, SE Robinson Wildlife Area, V-11-1991. HAMILTON: Beaver Cr, K Young Prk, Webster City, IX-10-1991 (thk). HOWARD: Turkey R, 5 mi S Cresco, IX-21-1991 (thk). LEE: Keokuk, VII-03-1957 to VIII-20-1957 (isu). MADISON: Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). MILLS: Council Bluffs, at light, VI-18-1984 (perc). MITCHELL: Cedar R

nr Osage, VII-24-1987 (perc). O'BRIEN: Floyd R, 43/12/01N 95/50/10W, and Little Floyd R, 43/08/41N 95/49/15W, IX-14-1999, and Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). PAGE: Tarkio R, St Rd 2, 8 mi E Clarinda, V-11-1991 (thk). STORY: Ames, V-24-1988, VIII-11-1991, and Iowa St Univ Hinds Irrigation Farm, Ames, VI-15-1987 to VI-15-1992, and South Skunk R, Iowa St Univ Hinds Irrigation Farm, VI-20-1987 to VII-3-1991, and South Skunk R, Soper's Mill Prk, VI-20-1991 (thk). VAN BUREN: Des Moines R, Lacy Keosauqua St Prk, VIII-29-1992, Des Moines R, Farmington, VIII-19-1991 (thk). WEBSTER: Des Moines R, Dolliver St Prk, IX-10-1991, V-18-1992 (thk). WINNEBAGO: Winnebago R, 43/26/02N 93/35/45W, IX-06-2000 (ihl). WORTH: Elk Cr, 43/23/17N 93/20/26W, IX-07-2000 (ihl).

*Remarks.*—This species is expected to occur throughout Iowa.

#### **Stenonema vicarium** (Walker)

*New data.*— ALLAMAKEY: French Cr, 43/22/38N 91/23/50W, VII-01-1996 (ihl). CLAYTON: Sny Magill Cr, 42/58/04N 91/13/24W, 1991-2001 (ihl). DELAWARE: Bloody Run, 42/38/42N 91/09/51W, I-05-2001 (ihl). DUBUQUE: Little Maquoketa R, 42/30/58N 90/50/01W, IX-21-1995 (ihl). FAYETTE: Dibble Cr, 43/01/34N 91/40/08W, VIII-04-1998 (ihl). WINNESHIEK: North Bear Cr, off Co Rd A24, 3 mi E Highlandville, above confluence with South Bear Cr and North Bear Cr, at Co Rd A24, 2.5 mi E Highlandville, IX-13-2001 (perc).

*Remarks.*—This relatively common eastern species is apparently confined to the summer-cool streams in the northeastern part of Iowa.

### ISONYCHIIDAE

#### **Isonychia bicolor** (Walker)

*Previous data.*—McDunnough (1931a): [SCOTT] (Davenport). Traver (1935) as *I. albomanicata* (Needham): [MUSCATINE] (Fairport). Klubertanz (1995): FAYETTE (Volga R); [HAMILTON] (Beaver Cr); [WINNESHIEK] (Upper Iowa R).

#### **Isonychia rufa** McDunnough

*Previous data.*—McDunnough (1931a): [SCOTT] (Davenport, Pleasant Valley). Traver (1935): [MUSCATINE] (Fairport); [SCOTT] (Davenport, Pleasant Valley). Thew (1956): [CLINTON] (DeWitt); [MUSCATINE] (Montpelier); [SCOTT] (Bettendorf). Kondratieff and Voshell (1984): [MONTGOMERY] (Red Oak).

*New data.*—BUENA VISTA: Little Sioux R, at Sioux Rapids Prk, IX-13-2001 (perc). CLAY: Peterson, VII-26-1987 (perc). DAVIS: North Fabius R at US Hwy 63, IX-11-2001 (perc). GREENE: West Buttrick Cr above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). MITCHELL: Cedar R at Spring Prk, 2 mi W Osage, IX-13-2001 (perc). OSCEOLA: Ocheyedon R, at Co Rd A34 (csu). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). STORY: Iowa St Univ Hinds Irrigation Farm, Ames, VI-16-1988 to VI-25-1992 (thk).

*Remarks.*—This is one of three species of Ephemeroptera that were originally described from Iowa (Edmunds 1962). Larvae of this species is difficult, if not impossible, to differentiate from the larvae of *I. bicolor*. All data reported herein for both species, however, are based on adult identifications.

#### **Isonychia sicca** (Walsh)

*Previous data.*—Hendrickson (1930) as *I. manca* Eaton: [LYON] (northeast of Beloit). McDunnough (1931a): [SCOTT] (Davenport, Pleasant Valley). Traver (1935): [MUSCATINE] (Fairport).

*New data.*—APPANOOSE: Chariton R, at St Rd 2, E Centerville, IX-11-2001 (perc). DAVIS: Fox R, at US Hwy 63, N Bloomfield, IX-11-2001 (perc). GREENE: West Buttrick Cr, above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US

Hwy 30, IX-12-2001 (perc). GUTHRIE: Brushy Cr, at Co Rd F16, IX-12-2001 (perc). MONONA: Soldier R, 1 mi SW Ute, at St Rd 183, IX-12-2001 (perc). PALO ALTO: West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). VAN BUREN: Fox R, at St Rd 2, IX-10-2001 (perc); Des Moines R, Lacy Keosauqua St Prk, VIII-29-1992 (thk). UNION: Platte R, at St Rd 25, IX-11-2001 (perc). WINNESHIEK: Upper Iowa R, Kendallville, and Chimney Rock Prk, Bluffton, IX-22-1991 (thk).

## LEPTOHYPHIDAE

**Tricorythodes allectus** (Needham)

*New data*.—ADAIR: West Fork Middle Nodaway R, at Co Rd G61, IX-12-2001 (perc). APPANOOSE: Chariton R, at St Rd 2, IX-11-2001 (perc). BLACK HAWK: Cedar Falls, VIII-06-1974 (perc).

*Remarks*.—The new state records given here for *T. allectus* are all based on male adult specimens. Although we have numerous samples of *Tricorythodes* larvae from throughout the state, they cannot be reliably identified to species because of the current state of taxonomy of this genus in the northeastern United States. Manitoba (McCafferty and Randolph 1998) and Iowa are at the westernmost known distributional limits of *T. allectus*.

**Tricorythodes stygiatus** McDunnough

*Previous data*.—Klubertanz (1995): FAYETTE (Volga R).

*Remarks*.—Iowa represents the westernmost known range limits of this species.

## LEPTOPHLEBIIDAE

**Leptophlebia cupida** (Say)

*Previous data*.—Klubertanz (1995): FRANKLIN (near Sheffield).

**Leptophlebia nebulosa** (Walker)

*Previous data*.—Hendrickson (1930) as *Blasturus*: [STORY] (north of Ames), [HAMILTON] (south of Stanhope). Burian (2001): STORY (Ames).

*New data*.—SCOTT: Quad City area [see Rock Island County, Illinois (Walsh 1862 as *Potamanthus odonatus* Walsh, 1862)].

**Paraleptophlebia debilis** (Walker)

*New data*.—CLAYTON: Sny-Magill Cr, 42/96/80N 91/22/30W, VIII-25-1993, IHL.

**Paraleptophlebia praepedita** (Eaton)

*Previous data*.—Klubertanz (1995): [HANCOCK] (Pilot Knob St Prk); STORY (Ames).

*New data*.—BREMER: East Fork Wapsipinicon R nr Tripoli, 42/50/51N 92/13/48W, VIII-28-1997, and Wapsipinicon R nr Tripoli, 42/50/10N 92/15/26W, VIII-20-1996 (wql). FLOYD: Flood Cr nr Powersville, 42/54/26N 92/43/14W, VIII-25-1997 (wql). STORY: South Skunk R nr Story City, 42/08/14N 93/34/02W, VIII-18-1997 (wql).

*Remarks*.—Although this species is known across Canada from Alberta to Quebec (McCafferty and Randolph 1998), in the United States it appears restricted to the East, with Iowa representing the westernmost fringe of its distribution.

## METREPODIDAE

**Siphloplecton interlineatum** (Walsh)

*Previous data*.—Klubertanz (1995): [POLK] (Des Moines R).

*New data*.—BREMER: Cedar R, Janesville, Rt 218, IV-12-1996 (csu). FLOYD: Cedar R, 43/0.539N 92/36.181W, X-28-1999 (ihl). SCOTT: Quad City area [see

Rock Island County, Illinois (Walsh 1863 as *Baetis interlineata* Walsh).

*Remarks.*—This relatively widespread species has not been taken from the Mississippi River in either Scott County, Iowa or Rock Island County, Illinois since the Walsh (1863) original type locality record cited above (Randolph and McCafferty 1998).

#### OLIGONEURIIDAE

##### *Homoeoneuria ammophila* (Spieth)

*Previous data.*—McCafferty and Hubbard (1998): IDA (Maple R).

*New data.*—DES MOINES: Skunk R at Augusta, VIII-12-1996 (wql).

#### POLYMITARCYIDAE

##### *Ephoron album* (Say)

*Previous data.*—Traver (1935): [MUSCATINE] (Fairport). Hamilton (1959): HENRY (Mount Pleasant); STORY (Ames).

*New Data.*—APPANOOSE: Chariton R, at St Rd 2, E Centerville, IX-11-2001 (perc). BOONE: Des Moines R, Ledges St Prk, VI-26-1963, VII-06-1964 (isu). CHICKASAW: Crane Cr, 43/12/50N 92/16/40W, IX-7-1994 (ihl). DICKINSON: Lake Okoboji, Iowa Lakeside labs, V-27-1988 (thk). HOWARD: Upper Iowa R, Cresco, IX-29-1990 (thk). O'BRIEN: Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). STORY: South Skunk R, Iowa St Univ Hinds Irrigation Farm, Ames, VI-20-1987 to VI-25-1992 (thk); Soper's Mill Prk, IX-12-1974 (isu). VAN BUREN: Des Moines R, Farmington, VI-12-1992 (thk). WAPELLO: Des Moines R, Great Eagle St Prk, 1 mi SE Ottumwa, VI-12-1992 (thk). WINNESHIEK: Upper Iowa R, Kendallville, IX-22-1991 (thk).

##### *Ephoron leukon* Williamson

*Previous data.*—McCafferty (1994): WINNESHIEK ([Upper] Iowa R). Klubertanz (1995): FAYETTE (Volga R).

*New data.*—MUSCATINE: Fairport, VII-10-1931 (cu).

*Remarks.*—Manitoba (McCafferty and Randolph 1998), Minnesota, Iowa, Missouri, and central Texas (McCafferty 1994) apparently form the western distributional limits of this species in North America.

##### *Tortopus primus* (McDunnough)

*Previous data.*—Thew (1956): [SCOTT] (Buffalo). Hamilton (1959): STORY (Ames).

*New data.*—DES MOINES: Skunk R at Augusta, VIII-12-1996 (wql).

#### POTAMANTHIDAE

##### *Anthopotamus myops* (Walsh)

*Previous data.*—Thew (1956) as *Potamanthus myops* (Walsh): [SCOTT] (Bettendorf, Davenport). Bae and McCafferty (1991): BOONE (Des Moines R); CERRO GORDO (Lime Cr, Winnebago R); FAYETTE (Turkey Run); HARDIN (Iowa R); STORY ([South] Skunk R); [BUENA] VISTA ([Little] Sioux R).

*New data.*—BOONE: Des Moines R, Ledges St Prk, VI-19-1992 (thk). BREMER: Cedar R, IX-27-1990 (thk). BUENA VISTA: Little Sioux R, at Sioux Rapids St Prk, IX-13-2001 (perc). GREENE: West Buttrick Cr above confluence with East Buttrick Cr, off Co Rd P33, 1 mi N US Hwy 30, IX-12-2001 (perc). GUTHRIE: Middle Raccoon R, SE Robinson Wildlife Area, V-11-1991 (thk). HAMILTON: Beaver Cr, K Young Prk, Webster City, IX-10-1991 (thk). HOWARD: Turkey R, 5 mi S Cresco, and Upper Iowa R, 1.5 mi S Cresco, IX-21-1991 (thk). LEE: Keokuk, VII-03-1957 to VIII-09-1958 (isu). MADISON: Middle R, 41/17/45N 94/04/32W, IX-16-1998 (ihl). MITCHELL: Cedar R, at Spring Prk, 2 mi E Osage, IX-13-2001 (perc). O'BRIEN: Waterman Cr, 42/58/45N 95/25/39W, VIII-02-1995 (ihl). PALO ALTO:



West Fork Des Moines R, at Co Rd B55, IX-13-2001 (perc). STORY: Iowa St Univ Hinds Irrigation Farm, Ames, VI-10-1988 to VI-22-1992 (thk); Soper's Mill Prk, IV-28-1977 (isu). WEBSTER: Dayton, IX-08-1974 (isu); Des Moines R, Dolliver St Prk, IX-10-1991, V-18-1992 (thk). WINNESHIEK: Upper Iowa R, Chimney Rock Prk, Bluffton, and Kendallville, IX-22-1991 (thk).

*Remarks.*—This basically Eastern and Midwestern species is found further west than Iowa only in North Dakota and Kansas (Bae and McCafferty 1991). *Anthopotamus myops* is sympatric with *A. verticis* (see below) for the most part. *Anthopotamus myops* was originally described from Rock Island, Illinois (Walsh 1863). As in the case of other large-river species described originally from Rock Island, it likely developed in the Mississippi River, where the river is common to Iowa. Its presence in Iowa was further borne out by the discovery of the species at Davenport nearly a century later (Thew 1956).

#### ***Anthopotamus verticis* (Say)**

*Previous data.*—Needham (1920) as *Potamanthus flaveola* (Walsh): [MUSCATINE] (Fairport); [SCOTT] (Davenport). Thew (1956) as *Potamanthus verticis* (Walsh): [MUSCATINE] (Muscatine); [SCOTT] (Bettendorf, Buffalo, Davenport). Bae and McCafferty (1991): POLK.

*Remarks.*—Based on the existent data as cited herein, it appears that *A. verticis* larvae are found in somewhat larger rivers in Iowa than those of the congener *A. myops*. This stream-size association in Iowa agrees with conclusions of Yanoviak and McCafferty (1995) that were based on the statistical analysis of occurrences in different length streams by certain mayflies, including species of *Anthopotamus* McCafferty and Bae.

### PSEUDIRONIDAE

#### ***Pseudiron centralis* McDunnough**

*Previous data.*—Traver (1935): [MUSCATINE] (Fairport). Pescador (1985): "COUNTY 77" [=POLK].

### SIPHONURIDAE

#### ***Siphonurus alternatus* (Say)**

*Previous data.*—Klubertanz (1995): [LEE] (near Keokuk).

*Remarks.*—This species is well known from northeastern North America. It is found as far south in the Midwest as northern Illinois and Indiana (Randolph and McCafferty 1998). Minnesota (Lager et al. 1982) and Iowa form its western limits in the United States, but in Canada it ranges as far west as Alberta and the Yukon (McCafferty and Randolph 1998).

#### ***Siphonurus marshalli* Traver**

*New data.*—JOHNSON: Turkey Cr, 41.768N 91.553W, VI-18-2002 (ihl).

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