

THE MAYFLY FAUNA OF NEW YORK STATE (INSECTA: EPHEMEROPTERA)

LUKE M. JACOBUS AND W. P. MCCAFFERTY

Department of Entomology, Purdue University, West Lafayette, Indiana 47907

Abstract.—A total of 173 species of mayflies, representing 15 families and 45 genera, are reported from the state of New York. First state records for 43 species and 891 new county reports for 129 species are included. Previously published reports are summarized, and pertinent remarks on species are annotated. The occurrence of *Dannella provonshai*, *Heptagenia julia*, and *Plauditus gloveri* in New York represent significant range extensions. The discovery of *Epeorus frisoni* in New York represents only the second report of the species. Species potentially of environmental concern are noted.

Early published studies of New York mayflies were conducted by Needham (1901, 1903, 1905, 1908b) and Morgan (1911). Needham (1928) compiled a first checklist for New York, including 61 species (52 currently valid). Subsequent limnological, ecological, and taxonomic studies provided documented records for an additional 64 species in the state. Forty-one species had been originally described from New York, and 21 are currently valid: *Ameletus ludens* Needham, *Anthopotamus neglectus* (Traver), *Brachycercus lacustris* (Needham), *Caenis anceps* Traver, *Drunella lata* (Morgan), *D. tuberculata* (Morgan), *Epeorus fragilis* (Morgan), *E. pleuralis* (Banks), *Ephemerella dorothea* Needham, *E. rotunda* Morgan, *Habrophlebia vibrans* Needham, *Litobranchea recurvata* (Morgan), *Paraleptophlebia mollis* (Eaton), *Rhithrogena amica* Traver, *Serratella deficiens* (Morgan), *S. serrata* (Morgan), *Siphonuriscia aerodromia* Needham, *Siphonurus barbarus* McDunnough, *Stenonema ithaca* (Clemens and Leonard), and *Tricorythodes allectus* (Needham).

The present accounting of 173 species of mayflies for New York includes a summary of relevant literature, 891 new county reports for 129 species, and the first documented state records for 43 species. Five species remain known from New York based only on simple listings or anecdotal reports. The identification of materials from museum and private collections and recent sampling in New York, along with data supplied by state and local agencies, were the bases for new data presented here. The only counties in the state without reports of mayflies are the metropolitan counties of Kings, New York, and Queens.

Certain New York mayflies remain poorly known or infrequently collected throughout their North American ranges. As such, they are candidates for being considered at environmental risk (see e.g., Master, 2000). *Ameletus tarteri* Burrows, *Dannella provonshai* (McCafferty), *Epeorus frisoni* (Burks), and *Siphonurus barbarus* McDunnough have been very infrequently reported. Also infrequently reported are *Baetis rusticans* McDunnough, *Epeorus suffusus* (McDunnough), *Heptagenia culacantha* Evans, Botts and Flowers, *H. julia* Traver, *Nixe rusticalis* (McDunnough), *Plauditus gloveri* McCafferty and Waltz, *Procloeon mendax* (Walsh), *P. ozburni* (McDunnough), *P. simile* (McDunnough), *P. vicinum* (Hagen), *Rhithrogena anomala*

McDunnough, *R. uhari* Traver, and *Siphonisca aerodromia* Needham. Summaries of the known continental distributions, larval habitats, and regional adult emergence times of these species are included under Discussion. A further understanding of taxonomic status or habitat requirements will be necessary before such species may be declared truly rare and possibly imperiled (see e.g., McCafferty, 1991; McCafferty and Edmunds, 1997). Habitat of *Siphonisca aerodromia*, a species which only questionably is imperiled (McCafferty and Edmunds, 1997), is currently protected by the Natural Heritage program in New York (pers. comm., Chris Fishel, St. Lawrence County, NY).

AQUATIC ENVIRONMENT

The state of New York is 122,310 sq km in area (Brunner, 2000), with elevation ranging from 1,628 m above sea level on Mt. Marcy, to land at sea level along the Atlantic coastline (DeLorme, 1998). Level and rolling plains border Lakes Champlain, Erie and Ontario, and flank the Mohawk and St. Lawrence river valleys. The state's Southern Tier is composed of rugged terrain. The Adirondacks in the northeast (highest elevations) and Catskills in the southeast are the most significant mountain ranges.

Diverse streams and wetlands provide mayfly habitat in New York and cover an estimated 405,000 to 972,000 ha (see also Reschke, 1990). Lotic habitats range from small rills to the Hudson River, an 87 km long tidal stream (Smith, 1983). The more than 43,500 km of streams provide varying critical factors affecting mayfly distribution, such as stream gradient, and related current and substrate types. Annual runoff, from 25 to 102 cm per year, is critical to the maintenance of the state's reservoir systems, which occasionally release water to regulate rivers. Stream flow in natural systems is usually maintained by snowmelt in the spring, and by ground water and runoff later in the year (Zembrzuski and Gannon, 1986). Lentic habitats range from small bog ponds to Lake Erie, the eleventh largest lake on Earth. In all, there are 5.4 million ha of lakes in New York (Zembrzuski and Gannon, 1986). Most freshwater wetlands are concentrated in the Adirondack Mountains, and in the areas east and south of Lake Ontario, especially in the Finger Lakes Region (Barringer et al., 1996). Despite the vast available freshwater habitat in New York, certain biological impoverishment caused by human pollution and acid rain has occurred in recent times (Schindler et al., 1989, Rogers and Hansen, 1992) and has likely affected mayfly distributions to some degree.

New York is part of four drainage regions. Fifty-three percent of the study area is in the Mid-Atlantic region, which is divided into five subregions (Fig. 1a, b, c, d, e). The Great Lakes Region is the next largest drainage area, covering 43 percent of the study area, and it is divided into four subregions (Fig. 1f, g, h, j). The Allegheny River basin, of the Ohio Region (Fig. 1k), drains nearly four percent of the study area. Land adjacent to the southeastern border (less than one percent of the state's total area) is part of the New England Region (Fig. 1m) (Zembrzuski and Gannon, 1986). All of the major drainage regions have been connected via canals for at least a century (Smith, 1983).

Although much of the Appalachian highlands in the state was glaciated, a portion of the Appalachian Plateau in Cattaraugus County in and around Allegany State Park

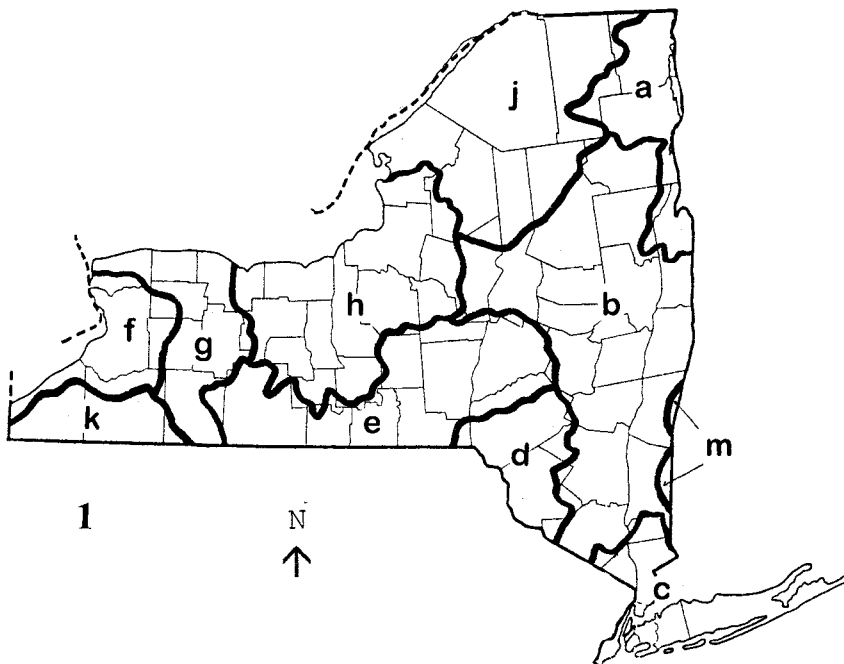


Fig. 1. New York with drainage systems: Mid-Atlantic Region (a = Richelieu, b = Upper Hudson, c = Lower Hudson - Long Island, d = Delaware, e = Susquehanna); Great Lakes Region (f = Eastern Lake Erie - Lake Erie, g = Southwestern Lake Ontario, h = Southeastern Lake Ontario, j = Northeastern Lake Ontario - Lake Ontario - St. Lawrence); Ohio Region (k = Allegheny River); m = New England Region.

and the Allegheny River has remained unglaciated (Reschke, 1990). As a result of glaciation, most of the New York fauna could not have existed in its present location for more than 16,000 years, and would most likely have colonized the state from the Mississippi Valley and Atlantic coast refuges. A pertinent discussion of freshwater fauna in New York related to glaciation was provided by Smith (1983).

METHODS AND PRESENTATION

Examination of mayfly collections at the C. P. Gillette Museum of Arthropod Diversity at Colorado State University (CSU), the Cornell University Insect Collection (CU), and the Purdue University Entomological Research Collection (PERC) contributed significant records to this study. Examination of materials loaned or donated to us by EcoAnalysts (EA), the Museum of Comparative Zoology at Harvard University (MCZ), U. S. National Museum (USNM), and the University of Michigan (UM) have contributed records to a lesser extent. A collecting trip to New York by LMJ and R. P. Randolph also provided valuable data. The donation of mayfly records stored in a computerized database by the New York State Department of Environmental Conservation's Stream Biomonitoring Unit (NYSDEC) greatly enriched this

indicated. All such data are also archived in the Ephemeroptera of North America database maintained at the Department of Entomology, Purdue University.

Some previous reports of species from New York were anecdotal, not based on actual specimens, or were included simply in a listing, unaccompanied by substantiating data, and therefore technically did not constitute actual records. McCafferty (2000) has indicated that actual records must contain complete enough data to be subject to verification. If a species has been reported previously without record data, and we are able to provide record data for the first time, we do so in full herein. The names of the five species that have been reported from New York, but that remain without actual record data, are indicated by a dagger (†).

In order to establish a species record for the first time from New York, at least one full record is provided for each New York county in which it is known to occur. All species with first substantiating records for New York provided herein are indicated by an asterisk (*). Complete available collecting data are also detailed for any new reports of infrequently collected North American species which could potentially prove to be of environmental concern.

SPECIES ACCOUNTS

AMELETIDAE

†*Ameletus cryptostimulus* Carle

Previous report. Zloty (1996): county unspecified.

Ameletus ludens Needham

Previous reports. Eaton (1885): Oneida. Needham (1905): Herkimer. Morgan (1911): Tompkins. Arbona (1980): counties unspecified.

New reports. NYSDEC: Greene, Ulster.

Ameletus tarteri Burrows

Previous report. Burrows (1987): Chemung.

Discussion. This infrequently taken species has also been reported by Burrows (1987) from locales in West Virginia and Virginia. In New York, Burrows (1987) reported it from McCorn Creek in Chemung County. Larvae were collected from rocky first and second order streams, and adults were taken in June and July.

†*Ameletus tertius* McDunnough

Previous report. Zloty (1996): county unspecified.

ARTHROPLEIDAE

**Arthroplea bipunctata* (McDunnough)

New report. Collection of B. L. Peckarsky: Lewis Co, Trout Falls Beaver Pond at Croghan, 26-IV-1986, C. Delucchi, larvae.

BAETIDAE

**Acentrella ampla* Traver

New reports. NYSDEC: Allegany Co, Little Genesee Cr, 42°03'30"N, 78°10'46"W, 23-VIII-1995, larvae; Oneida Co, Mohawk R, 43°13'04"N, 75°25'54"W, 31-V-1995, larvae; Oswego Co, Salmon R, 43°31'27"N, 75°47'14"W, 12-VII-1995, larvae; Wyoming Co, Silver Lake Outlet, 42°42'45"N, 77°57'48"W, 22-VIII-1995, larvae.

**Acentrella parvula* (McDunnough)

New report. CSU: Warren Co, Hudson R at Hwy 8, Riparius, 05-VI-1997, Kondratieff and Baumann, adults and larvae.

**Acentrella turbida* (McDunnough)

Previous report. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Oswego Co, Salmon R, Hwy 13, SE Pulaski, 17-VI-1997, Kondratieff and Baumann, adults and larvae. NYCDEP: Delaware Co, Loomis Brook, 75°16'47"N, 42°10'25"W, 08-IX-1998, M. Rosenfeld and C. R. Cutietta-Olson, larvae; Putnam Co, Brady Brook, 41°31'56"N, 73°35'04"W, 04-VIII-1998, M. Rosenfeld and C. R. Cutietta-Olson, larvae. PERC: Livingston Co, Genesee R, 42°34'17"N, 78°02'30"W, 01-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae; Tompkins Co, Buttermilk Cr, nr NY13, S of Ithaca, 27-VII-1999, L. M. Jacobus and R. P. Randolph, adults.

**Acerpenna macdunnoughi* (Ide)

New reports. NYCDEP: Delaware Co, W Br Delaware R, 42°22'23"N, 74°40'01"W, 20-IX-1995, M. Rosenfeld and C. R. Cutietta-Olson, larvae; Westchester Co, tributary of New Croton Reservoir, 41°16'57"N, 73°43'32"W, M. Rosenfeld and C. R. Cutietta-Olson, larvae. NYSDEC: Albany Co, Patroon Cr, 42°39'52"N, 73°44'48"W, 01-X-1998, larvae; Cayuga Co, Dutch Hollow Brook, 42°49'54"N, 76°24'46"W, 30-VII-1998, larvae; Chenango Co, Beaver Cr, 42°44'04"N, 75°18'35"W, 10-IX-1997, larvae; Otsego Co, Otsdawa Cr, 42°24'00"N, 75°10'20"W, 12-IX-1997, larvae; Sullivan Co, Little Beaver Kill, 41°52'21"N, 74°42'30"W, 26-VII-1994, larvae; Washington Co, Mud Brook, 43°33'44"N, 73°20'49"W, 19-VIII-1998, larvae.

Acerpenna pygmaea (Hagen)

Previous reports. Needham (1901): Franklin. Needham (1905): Tompkins. Needham (1928): Fulton.

New reports. NYCDEP: Delaware, Dutchess, Greene, Putnam, Westchester. NYSDEC: Cayuga, Chemung, Chenango, Clinton, Hamilton, Jefferson, Lewis, Montgomery, Ontario, St. Lawrence, Steuben, Sullivan, Tioga, Washington. PERC: Wyoming.

**Baetis brunneicolor* McDunnough

New reports. CSU: Warren Co, Hudson R, Hwy 8, Riparius, 5-VI-1997, Kondratieff and Baumann, adults and larvae. NYCDEP: Putnam Co, East Branch Croton R, 41°23'38"N, 73°36'30"W, 28-VIII-1997, larvae. NYSDEC: Albany Co, Coeymans Cr, 42°32'19"N, 73°49'41"W, 11-VI-1987, larvae; Allegany Co, Oil Cr, 42°13'01"N, 78°18'40"W, 10-VII-1990, larvae; Broome Co, Tioughnioga R, 42°20'56"N, 75°59'58"W, 11-VI-1992, larvae; Cattaraugus Co, Ischua Cr, 42°19'17"N, 78°27'54"W, 10-VII-1990, larvae; Cayuga Co, Yawger Cr, 42°52'43"N, 76°41'01"W, 30-VII-1998, larvae; Chautauqua Co, Chautauqua Cr, 42°20'15"N, 79°36'04"W, 19-V-1987, larvae; Chemung Co, Chemung R, 42°03'30"N, 76°45'38"W, 16-VII-1992, larvae; Chenango Co, Chenango R, 42°28'54"N, 75°32'16"W, 25-VII-1989, larvae; Clinton Co, Jackson Brook, 44°26'37"N, 73°40'26"W, 18-VIII-1998, larvae; Columbia Co, Roeliff Jansen Kill, 42°09'11"N, 75°50'41"W, 28-VII-1992, larvae; Cortland Co, Factory Brook, 42°39'43"N, 76°12'20"W, 09-IX-1997, larvae; Delaware Co, Vly Cr, 42°09'20"N, 74°31'34"W, 27-VII-1995, larvae; Dutchess Co, Swamp R, 41°42'55"N, 73°34'34"W, 26-VIII-1992, larvae; Erie Co, Big Sister Cr, 42°39'17"N, 79°02'02"W, 24-VIII-1994, larvae; Essex Co, North Branch Boquet R, 44°19'22"N, 73°26'49"W, 19-VIII-1998; Fulton Co, Hall Cr, 43°01'00"N, 74°23'01"W, 06-VI-1989, larvae; Greene Co, Batavia Kill, 42°18'29"N, 74°13'53"W, 23-VI-1989, larvae; Herkimer Co, Middle Branch Moose River, 43°39'44"N, 75°04'23"W, 18-IX-1996, larvae; Jefferson Co, Indian R, 44°08'55"N, 75°43'53"W, 12-VIII-1987, larvae; Lewis Co, Balsam Cr, 43°57'09"N, 75°20'23"W, 17-IX-1996, larvae; Livingston Co, Canaseraga Cr, 42°44'12"N, 77°50'26"W, 27-VI-1990, larvae; Madison Co, Oriskany Cr, 42°55'54"N, 75°28'13"W, 14-VIII-1990, larvae; Monroe Co, 43°07'21"N, 77°38'08"W, 08-IX-1992, larvae; Montgomery Co, Cayadutta Cr, 42°58'02"N, 74°25'15"W, 21-VII-1992, larvae; Niagara Co, Tonawanda Cr, 43°05'36"N, 78°38'11"W, 23-VIII-1994, larvae; Oneida Co, Sauquoit Cr, 43°02'50"N, 75°16'35"W, 28-VIII-1990, larvae; Onondaga Co, Harbor Brook, 43°01'03"N, 76°12'59"W, 20-VI-1989, larvae; Ontario Co, Great Brook, 42°58'50"N, 77°24'34"W, 28-VIII-1996, larvae; Orange Co, Browns Cr, 41°20'26"N, 74°21'13"W, 07-IX-1994, larvae; Orleans Co, Oak Orchard Cr, 43°18'04"N, 78°18'39"W, 31-VII-1990, larvae; Otsego Co, Susquehanna R, 42°19'14"N, 75°19'33"W, 10-IX-1997, larvae; Rensselaer Co, Mill Cr, 42°36'46"N, 73°41'44"W, 15-VI-1989, larvae; Saratoga Co, Kayaderoseras Cr, 43°01'07"N, 73°49'35"W, 01-X-1997, larvae; Schenectady Co, Poentic Kill, 42°48'29"N, 73°59'34"W, 15-VI-1987, larvae; Schoharie Co, 42°48'29"N, 73°59'34"W, 15-VI-1987, larvae; St. Lawrence Co, Oswegatchie R, 44°35'21"N, 75°19'17"W, 03-VII-1991, larvae; Steuben Co, Cohocton R, 42°10'03"N, 77°06'19"W, 12-VIII-1998, larvae; Suffolk Co, Peconic R, 40°54'13"N, 72°45'53"W, 23-VII-1998, larvae; Sullivan Co, Mongaup R, 41°25'36"N, 74°45'22"W, 01-IX-1993, larvae; Tioga Co, Susquehanna R, 42°03'40"N, 76°08'24"W, 10-IX-1997, larvae; Ulster Co, Shawangunk Kill, 41°41'14"N, 74°10'22"W, 08-IX-1994, larvae; Washington Co, Batten Kill, 43°05'56"N, 73°16'56"W, 05-VII-1994, larvae; Wayne Co, Ganargua Cr, 43°04'04"N, 77°18'01"W, 13-VII-1995, larvae; Yates Co, Keuka L Outlet, 42°40'50"N, 76°57'15"W, 25-VI-1990, larvae.

Baetis flavistriga McDunnough

Previous reports. Traver (1935): Rensselaer, St. Lawrence, Tompkins.

New reports. CU: Chemung. NYSDEC: Albany, Broome, Cattaraugus, Cayuga,

Chautauqua, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Madison, Montgomery, Niagara, Oneida, Onondaga, Orange, Oswego, Otsego, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Sullivan, Tioga, Ulster, Warren, Washington, Wayne, Westchester, Yates. PERC: Allegany, Livingston, Ontario, Orleans, Wyoming. WLS: Livingston, Monroe, Steuben.

Baetis intercalaris McDunnough

Previous reports. Traver (1935): Herkimer, St. Lawrence, Tompkins.

New reports. NYSDEC: Albany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Fulton, Genesee, Greene, Jefferson, Lewis, Madison, Monroe, Montgomery, Niagara, Oneida, Ontario, Orange, Orleans, Oswego, Otsego, Rensselaer, Richmond, Rockland, Saratoga, Schoharie, Steuben, Suffolk, Sullivan, Tioga, Ulster, Warren, Washington, Wayne, Westchester, Yates. PERC: Allegany, Livingston, Wyoming.

Discussion. Some of the New York larval specimens of this species proved similar to the less patterned color morph of *B. intercalaris* reported from Pennsylvania and Oklahoma by Waltz et al. (1996).

**Baetis pluto* McDunnough

New reports. NYCDEP: Putnam Co, Croton R, 41°23'19"N, 73°41'03"W, 30-VII-1998, larvae. NYSDEC: Jefferson Co, Black R, 43°59'44"N, 75°38'08"W, 14-VII-1982, larvae; Lewis Co, Beaver R, 43°53'53"N, 75°29'38"W, 22-IX-1982, larvae; Rensselaer Co, Muitzes Kill, 42°31'02"N, 73°45'31"W, 30-IX-1998, larvae; Saratoga Co, Fish Cr, 43°05'42"N, 73°36'47"W, 05-VII-1994, larvae; St. Lawrence Co, Grass R, 44°36'40"N, 75°11'05"W, 09-VII-1992, larvae; Steuben Co, Canisteo R, 42°22'22"N, 77°41'23"W, 09-VI-1988, larvae; Sullivan Co, Lower Neversink R, 41°43'48"N, 74°36'15"W, 20-VIII-1987, larvae; Tompkins Co, Fall Cr, 42°27'11"N, 76°29'40"W, 09-IX-1987, larvae.

Baetis posticatus Say

Previous report. Needham (1908b): Herkimer.

Discussion. This species remains a nomen dubium (McCafferty 1996a).

Baetis rusticans McDunnough

Previous report. Traver (1935): St. Lawrence.

Discussion. In New York, Traver (1935) reported this infrequently taken species from Ft. Jackson in St. Lawrence County. Outside New York, it has been reported only from Quebec (McDunnough, 1925b), Ontario (Walley, 1927), and questionably Texas (Baumgardner et al., 1997).

Baetis tricaudatus Dodds

Previous report. Traver (1935): Tompkins.

New reports. CSU: Hamilton. NYSDEC: Albany, Broome, Cattaraugus, Cayuga,

Chautauqua, Chemung, Chenango, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Greene, Herkimer, Jefferson, Lewis, Madison, Montgomery, Niagara, Oneida, Ontario, Orange, Oswego, Rensselaer, Richmond, Rockland, Schoharie, St. Lawrence, Sullivan, Tioga, Ulster, Warren, Washington, Wayne, Wyoming. PERC: Clinton. WLS: Genesee, Livingston, Monroe, Steuben.

Callibaetis ferrugineus (Walsh)

Previous reports. Hagen (1861): county unspecified. Eaton (1871): county unspecified. Banks (1900): Nassau. Needham (1908b): Herkimer. Needham (1928): Franklin, Richmond, Suffolk, Westchester. Traver (1935): Hamilton, Tompkins.

New reports. PERC: Dutchess, Madison, Onondaga, Yates.

Callibaetis fluctuans (Walsh)

Previous report. Morgan (1913): Tompkins.

New report. PERC: Suffolk.

**Callibaetis pallidus* Banks

New reports. CU: Lewis Co, Michigan Mills, 1-IX-1926, adult; Monroe Co, Rochester, 15-V-1930, P. R.N., adult.

†*Callibaetis pretiosus* Banks

Previous report. Check (1982): county unspecified.

Discussion. Reports of *C. pretiosus* from Pennsylvania by Waltz and Munro (1996) and from Connecticut by Burian and Bednarik (1994) further suggest the likelihood of its presence in New York.

Callibaetis skokianus Needham

Previous report. Traver (1935): Tompkins.

New report. PERC: Allegany.

Discussion. This species was mistakenly included in a list of species originally described from New York that was provided by Edmunds (1962); actually, it was originally described from Illinois (Needham, 1903).

**Centroptilum triangulifer* (McDunnough)

New report. PERC: Chenango Co, Otselic R, 42°40'47"N, 74°45'33"W, 31-VII-1999, L. M. Jacobus and R. P. Randolph, larvae.

Dipheter hageni (Eaton)

Previous reports. Delucchi (1989), Delucchi and Peckarsky (1989): Tompkins.

New reports. NYCDEP: Delaware, Greene, Putnam, Sullivan, Ulster, Westchester.

Heterocloeon curiosum (McDunnough)

Previous reports. Traver (1935): Erie, St. Lawrence.

New reports. CSU: Oswego. NYCDEP: Delaware. NYSDEC: Columbia, Dutchess, Tioga, Washington.

**Heterocloeon frivolum* (McDunnough)

New report. NYCDEP: Putnam Co, Croton R, 41°26'50"N, 73°33'23"W, 27-VIII-1996, larvae.

**Paracloeodes minutus* (Daggy)

New report. PERC: Livingston Co, Genesee R, 42°34'16"N, 78°02'25"W, 01-VIII-1999, L. M. Jacobus and R. P. Randolph, adults and larva.

**Plauditus cestus* (Provonsha and McCafferty)

New report. EA: Sullivan Co, Neversink R, 41°36'45"N, 74°37'25"W, 18-VII-1997, B. Baldigo, K. Murray, larvae.

**Plauditus dubius* (Walsh)

Previous reports. Traver (1935): Erie. Arbona (1980): Delaware or Sullivan.
New report. PERC: Tompkins.

**Plauditus gloveri* McCafferty and Waltz

New reports. PERC: Livingston Co, Genesee R, 42°34'17"N, 78°02'30"W, 01-VIII-1999, L. M. Jacobus and R. P. Randolph, larva.

Discussion. This represents a significant extension of the known distributional range of *P. gloveri*, which was previously known from South Carolina (McCafferty and Waltz, 1998) and unpublished data from east Texas (Montgomery County, 15-VII-1997, J. Rosenthal (EA)).

**Plauditus punctiventris* (McDunnough)

New reports. NYCDEP: Delaware Co, Delaware R, 42°09'26"N, 75°03'30"W, 09-IX-1998, C. R. Cutietta-Olson and M. Rosenfeld, larvae; Sullivan Co, Rondout Cr, 41°52'00"N, 74°29'12"W, 03-IX-1998, C. R. Cutietta-Olson and M. Rosenfeld, larvae; Ulster Co, Esopus Cr, 42°02'48"N, 74°16'38"W, 16-IX-1998, C. R. Cutietta-Olson and M. Rosenfeld, larvae.

**Plauditus virilis* (McDunnough)

New reports. NYCDEP: Putnam Co, East Branch Croton R, 41°26'50"N, 73°33'24"W, 28-VIII-1997, C. R. Cutietta-Olson and M. Rosenfeld, larvae; Westchester Co, tributary Kensico Reservoir, 73°44'38"N, 41°07'29"W, 26-III-1998, M. Rosenfeld, larvae. PERC: Allegany Co, Genesee R, 42°13'26"N, 78°01'51"W, 02-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae; Livingston Co, Genesee R, 42°34'17"N, 78°02'30"W, 01-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae; Wyoming Co, East Koy Cr, 42°35'53"N, 78°06'17"W, 02-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae.

Procloeon fragile (McDunnough)

Previous report. Traver (1935): St. Lawrence.

Procloeon mendax (Walsh)

Previous report. Needham (1908b): Herkimer.

Discussion. This infrequently taken species has also been reported from Ontario (Ide, 1930), Illinois (Burks, 1953), Maine (Burian and Gibbs, 1991), and Michigan (Randolph and McCafferty, 1998). In New York, it has been reported from the foot of First Lake (Needham, 1908b) and Old Forge (Traver, 1935). Larvae inhabit depositional areas of first through third order streams, and adults have been taken in September (Burian and Gibbs, 1991).

Procloeon ozburni (McDunnough)

Previous report. Traver (1935): Tompkins.

Discussion. This infrequently taken species has also been reported from Quebec (McDunnough, 1924a), Ontario (McDunnough, 1925a), and Maine (Burian and Gibbs, 1991). In New York, it has been reported from Ringwood, near Ithaca (Traver, 1935). Larvae inhabit vegetation in first through third order streams; adults have been taken in July (Burian and Gibbs, 1991).

**Procloeon rivulare* (Traver)

New report. PERC: Wyoming Co, East Koy Cr, 42°35'53"N, 78°06'17"W, 02-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae.

**Procloeon rubropictum* (McDunnough)

Previous report. Traver (1935): Tompkins.

New report. PERC: Allegany.

**Procloeon rufostrigatum* (McDunnough)

New report. PERC: Allegany Co, Genesee R, 42°13'26"N, 78°01'51"W, 02-VIII-1999, L. M. Jacobus and R. P. Randolph, larva.

Procloeon simile (McDunnough)

Previous reports. Traver (1935): Rensselaer, St. Lawrence.

New report. PERC: Tompkins Co, Ithaca, 04-V-1937, J. R. Traver, adult.

Discussion. This infrequently collected species has also been reported from Quebec (McDunnough, 1924a), Ontario (Traver, 1935), and North and South Carolina (Pescador et al., 1999). No record data accompany the reports from the Carolinas. In New York, it has been reported from Ft. Jackson and Nassau (Traver, 1935). Adults have been collected in May and June.

Procloeon vicinum (Hagen)

Previous report. Needham (1908b): Herkimer.

Discussion. This infrequently taken species has otherwise been reported only from the District of Columbia (Hagen, 1861) and West Virginia (Burks, 1953); however, no record data accompany the latter report. In New York, it has been reported from the foot of First Lake (Needham, 1908b).

**Procloeon viridoculare* (Berner)

New report. PERC: Allegany Co, Genesee R, 42°13'26"N, 74°01'51"W, 02-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae.

Pseudocloeon propinquum (Walsh)

Previous reports. Needham (1928): Tompkins. Traver (1935): Franklin.

New report. NYSDEC: Delaware.

BAETISCIDAE

Baetisca callosa Traver

Previous report. Traver (1935): Hamilton.

Discussion. This species remains a nomen dubium (McCafferty, 1996a).

**Baetisca lacustris* McDunnough

New report. CSU: Warren Co, Hudson R at Hwy 8, Riparius, 05-VI-1997, Kondratieff and Baumann, adults and larvae.

Baetisca laurentina McDunnough

Previous report. Pescador and Berner (1981): county unspecified [Ausable L].

New report. PERC: Hamilton.

Baetisca obesa (Say)

Previous reports. Needham (1905): Herkimer, Niagara. Clemens (1915): Fulton.

CAENIDAE

Brachycercus lacustris (Needham)

Previous report. Needham (1918): county unspecified [Oneida Lake].

Brachycercus maculatus Berner

Previous reports. Burian et al. (1997): Saratoga, Warren.

Caenis amica Hagen

Previous reports. Traver (1935): Clinton, Franklin, Rensselaer, Tompkins.

New reports. NYSDEC: Monroe. PERC: Onondaga.

Caenis anceps Traver

Previous reports. Traver (1935): Montgomery, Tompkins.

New reports. NYCDEP: Greene. NYSDEC: Albany, Broome, Cattaraugus, Clinton, Columbia, Dutchess, Franklin, Fulton, Ontario, Orange, Oswego, Otsego, Rockland, Steuben, Tioga, Washington. PERC: Chenango, Livingston, Wyoming.

Caenis diminuta Walker

Previous reports. Needham (1901): Franklin. Needham (1908b): Herkimer. Needham (1926): Tompkins. Needham (1928): Jefferson, Warren.

Caenis hilaris (Say)

Previous reports. Needham (1905): Tompkins. Needham (1928): Jefferson. Traver (1935): Montgomery.

Caenis latipennis Banks

Previous reports. Traver (1935): Herkimer, Jefferson, Tompkins. Provonsha (1990): Chautauqua.

New reports. NYSDEC: Albany, Clinton, Cortland, Erie, Montgomery, Oswego, St. Lawrence, Sullivan, Washington, Wayne. PERC: Allegany, Cattaraugus, Genesee, Livingston, Madison, Ontario, Wyoming.

Caenis maccafferti Provonsha

Previous report. Provonsha (1990): Delaware.

New report. NYSDEC: Sullivan.

Caenis punctata McDunnough

Previous reports. Traver (1935): Franklin, Jefferson, Warren.

New reports. NYSDEC: Albany. PERC: Allegany, Cattaraugus, Genesee, Onondaga, Yates.

**Caenis tardata* McDunnough

New report. PERC: Chenango Co, Otselic R, 42°40'47"N, 74°45'33"W, 31-VII-1999, L. M. Jacobus and R. P. Randolph, larvae; Wyoming Co, East Koy Cr, 42°35'54"N, 78°06'17"W, 02-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae.

EPHEMERELLIDAE

Attenella attenuata (McDunnough)

Previous reports. Allen and Edmunds (1961): Suffolk. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan.

New reports. NYSDEC: Broome, Cattaraugus, Lewis.

**Attenella margarita* (Needham)

New reports. NYSDEC: Albany Co, Coeymans Cr, 42°32'08"N, 73°50'27"W, 6-VIII-1998, larvae; Greene Co, Schoharie Cr, 42°11'09"N, 74°09'24"W, 22-VI-1989, larvae; Sullivan Co, Lower Neversink R, 41°45'36"N, 74°35'57"W, 20-VIII-1987, larvae; Ulster Co, West Branch Neversink R, 41°58'27"N, 74°31'32"W, 01-VII-1987, larvae.

**Dannella lita* (Burks)

New reports. PERC: Sullivan Co, Bennett Brk, 24-VI-1988, J. & K. Bell, larvae.

**Dannella provonshai* (McCafferty)

New reports. PERC: Cayuga Co, "Afterglow", North Fair Haven, 31-VII-1932, J.G.N., larvae.

Discussion. This report represents a significant extension of the known range of this infrequently taken species. Previously, it had been reported only from a stream in the Ozark mountains of Arkansas (McCafferty, 1977) and a stream in the Appalachian Plateau of Kentucky (Randolph and McCafferty, 1998).

Dannella simplex (McDunnough)

Previous reports. Allen and Edmunds (1962a): Hamilton. Arbona (1980): Delaware or Sullivan.

New reports. NYSDEC: Erie, Essex, Oneida.

Drunella cornuta (Morgan)

Previous reports. Steger (1931): Cayuga, Cortland, Tioga, Tompkins. Allen and Edmunds (1962b): Sullivan. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan.

New reports. CU: Chemung, Livingston. NYSDEC: Delaware, Greene, Ulster. PERC: Albany, Oswego.

Discussion. This species was mistakenly included by Edmunds (1962) in a listing of species originally described from New York. This species was originally described from Connecticut (Morgan, 1911).

Drunella cornutella (McDunnough)

Previous report. Traver (1935): Tompkins.

New reports. CU: Chemung. NYSDEC: Broome, Cattaraugus, Chautauqua, Chenango, Clinton, Columbia, Cortland, Delaware, Essex, Franklin, Greene, Hamilton, Herkimer, Oneida, Ontario, Oswego, Rensselaer, Schoharie, Steuben, Sullivan, Ulster, Warren, Washington. WLS: Livingston.

Drunella lata (Morgan)

Previous reports. Morgan (1911): Tompkins. Allen and Edmunds (1962b): Hamilton, Washington. Arbona (1980): Delaware or Sullivan.

New reports. NYSDEC: Delaware, Essex, Oswego, St. Lawrence, Sullivan, Tioga. WLS: Livingston.

Drunella longicornis (Traver)

Previous report. Allen and Edmunds (1962b): county unspecified [Green L].

Drunella tuberculata (Morgan)

Previous reports. Morgan (1911): Tompkins. Traver (1935): St. Lawrence. Allen and Edmunds (1962b): county unspecified [Mt. Champlain].

New reports. NYSDEC: Hamilton, Sullivan, Warren.

Drunella walkeri (Eaton)

Previous reports. Allen and Edmunds (1962b): Hamilton. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Oswego. NYSDEC: Delaware, Essex, Warren, Washington.

**Ephemerella aurivillii* (Bengtsson)

Previous report. Bilger (1986): county unspecified.

New report. CU: Chemung Co, Van Etten, McCorn Cr, 7-IV-1976, Neil J. Lamb, larvae.

Ephemerella dorothea Needham

Previous reports. Needham (1908b): Herkimer. Steger (1931): Tioga, Tompkins. Traver (1935): Sullivan. Allen and Edmunds (1965): Clinton, Essex, Greene, Orange. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan.

New reports. CU: Chemung, St. Lawrence, Schuyler. NYSDEC: Albany, Cortland, Delaware, Oneida, Ulster. WLS: Genesee, Livingston, Monroe.

Ephemerella excrucians Walsh

Previous reports. Needham (1901): Franklin. Needham (1928): Warren, county unspecified [Cayuga L].

Ephemerella invaria (Walker)

Previous reports. Traver (1935): Tioga. Allen and Edmunds (1965): Sullivan, Tompkins. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Warren. NYSDEC: Albany, Herkimer, Monroe, Oneida, Rensselaer, Ulster. WLS: Steuben.

Ephemerella needhami McDunnough

Previous reports. Traver (1935): Tompkins. Allen and Edmunds (1965): Essex. Arbona (1980): counties unspecified [Beaver Kill and Delaware R].

New reports. NYSDEC: Cortland, Erie, St. Lawrence.

Ephemerella rotunda Morgan

Previous reports. Morgan (1911): Tompkins. Needham (1928): Otsego. Steger (1931): Cayuga, Cortland, Tioga. Allen and Edmunds (1965): Bronx, Putnam, Sullivan.

New reports. CSU: Hamilton, Oswego. CU: ?Cattaraugus, Chemung, Clinton, Ontario, Rensselaer, St. Lawrence. NYSDEC: Columbia, Orange, Steuben.

Ephemerella septentrionalis McDunnough

Previous reports. Steger (1931): Cortland. Traver (1935): Herkimer, St. Lawrence. Allen and Edmunds (1965): Sullivan.

Ephemerella subvaria McDunnough

Previous reports. Traver (1935): Tompkins. Allen and Edmunds (1965): Rockland, Sullivan, county unspecified [Green L]. Karouna and Fuller (1992): Madison.

New reports. CU: St. Lawrence. NYSDEC: Delaware, Greene, Rensselaer, Saratoga, Wyoming. WLS: Genesee, Monroe.

Eurylophella aestiva (McDunnough)

Previous reports. Traver (1935): Tioga, Tompkins. Funk et al. (1988): Delaware.

Eurylophella bicolor (Clemens)

Previous reports. Traver (1935): St. Lawrence, Tompkins; Yates or Steuben. Allen and Edmunds (1963b): Suffolk. Funk et al. (1988): Delaware. Funk and Sweeney (1994): Broome.

New reports. PERC: Clinton.

Eurylophella bicoloroides (McDunnough)

Previous reports. Funk and Sweeney (1994): Delaware, Oneida, Schoharie.

Eurylophella funeralis (McDunnough)

Previous reports. Traver (1935): Schuyler, Tompkins. Allen and Edmunds (1963b): Herkimer. Funk and Sweeney (1994): Broome, Delaware, Franklin, Lewis, St. Lawrence.

New reports. CU: Chemung. NYSDEC: Greene, Rensselaer, Saratoga, Warren.

Eurylophella lutulenta (Clemens)

Previous reports. Traver (1935): Livingston.

Eurylophella macdunnoughi Funk

Previous reports. Funk and Sweeney (1994): Delaware, Lewis.

Eurylophella minimella (McDunnough)

Previous report. Funk et al. (1988): Delaware.

Eurylophella temporalis (McDunnough)

Previous reports. Traver (1935): Tioga, Washington, county uncertain [Green L].

New reports. NYSDEC: Steuben, Warren.

Eurylophella verisimilis (McDunnough)

Previous reports. Allen and Edmunds (1963b): Delaware, Herkimer. Funk et al. (1988): Broome. Funk and Sweeney (1994): Franklin, Lewis, Oneida, St. Lawrence.

New reports. CU: Tompkins, Chemung.

Serratella deficiens (Morgan)

Previous reports. Morgan (1911): Tompkins. Steger (1931): Cayuga. Traver (1935): Rensselaer. Allen and Edmunds (1963a): Suffolk, county unspecified [Mt. Champlain]. Arbona (1980): counties unspecified.

New reports. CSU: Warren. NYSDEC: Albany, Broome, Cattaraugus, Chautauqua, Chemung, Clinton, Columbia, Cortland, Delaware, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Montgomery, Oneida, Orange, Oswego, Otsego, Saratoga, St. Lawrence, Steuben, Sullivan, Tioga, Ulster, Washington, Yates. PERC: Livingston, Chenango.

Serratella serrata (Morgan)

Previous reports. Morgan (1911): Tompkins. Traver (1935): Essex. Jacobus and McCafferty (2000): Sullivan.

New reports. CSU: Oswego. NYSDEC: Cattaraugus, Chenango, Clinton, Columbia, Delaware, Dutchess, Franklin, Herkimer, Lewis, Monroe, Orange, Otsego, Rensselaer, Saratoga, Ulster, Washington, Westchester.

**Serratella serratoides* (McDunnough)

New reports. CU: Delaware Co, Hancock, 03-VIII-1936, H. K. Townes. NYCDEP: Putnam Co, tributary East Branch Croton R, 41°23'38"N, 73°36'30"W, 04-VIII-1998, larvae, M. Rosenfeld and C. R. Cutietta-Olson. NYSDEC: Chemung Co, Chemung R, 24-VII-1984, larvae; Chenango Co, Chenango R, 42°35'02"N, 75°31'42"W, 25-VII-1989, larvae; Clinton Co, Great Chazy R, 44°59'13"N, 73°26'58"W, 19-VII-1994, larvae; Columbia Co, Roeliff Jansen Kill, 42°09'11"N, 73°50'41"W, 28-VII-1992, larvae; Essex Co, West Branch Ausable R, 44°24'13"N, 73°47'02"W, 27-VII-1989, larvae; Franklin Co, Trout R, 44°59'20"N, 74°17'55"W, 16-VII-1997, larvae; Jefferson Co, Black R, 44°00'16"N, 76°02'43"W, 15-VII-1982, larvae; Lewis Co, Fish Cr, 43°40'06"N, 75°21'12"W, 18-IX-1996, larvae; Madison Co, Oriskany Cr, 42°55'54"N, 75°28'13"W, 14-VIII-1990, larvae; Oneida Co, Oriskany Cr, 43°01'11"N, 75°24'05"W, 14-VIII-1990, larvae; Orange Co, Delaware R, 41°22'20"N, 74°41'50"W, 30-VIII-1994, larvae; Otsego Co, Unadilla R, 42°48'32"N, 75°14'56"W, 15-VII-1992, larvae; Rensselaer Co, Walloomsac R, 42°56'22"N, 73°17'06"W, 08-VII-1983, larvae; St. Lawrence Co, Grass R, 44°53'56"N, 75°01'00"W, 09-VII-1992, larvae; Steuben Co, Cohocton R, 42°12'23"N, 77°09'53"W, 16-VII-1992, larvae; Washington Co, Hoosic R, 42°57'05"N, 73°23'28"W, 18-VI-1985, larvae; Westchester Co, Beaver Dam Brook, 41°14'46"N, 73°40'09"W, 23-VI-1998, larvae. PERC: Sullivan Co, Neversink R, below Monticello, 1.5 mi South SR17, 18-VII-1997, K. Riva-Murray, larvae.

EPHEMERIDAE

Ephemera guttulata Pictet

Previous reports. Eaton (1883): county unspecified. Needham (1920): Fulton. Needham (1928): Orange, Tompkins, Clinton. Traver (1935): Essex, St. Lawrence, Sullivan. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Hamilton, Oswego. CU: Chemung. NYSDEC: Cattaraugus, Erie. PERC: Oneida.

Ephemera simulans Walker

Previous reports. Morgan (1911): Tompkins. Needham (1920): Erie, county unspecified [Cayuga L]. Needham (1928): Fulton, Warren. Arbona (1980): Delaware. **New reports.** CU: Cayuga, Chemung, Niagara, Otsego. PERC: Livingston, Westchester.

Ephemera varia Eaton

Previous reports. Needham (1901): Franklin. Needham (1908b): Herkimer. Needham (1920): Tompkins. Needham (1928): Fulton. Traver (1935): Cattaraugus, Montgomery, Oneida, Schuyler. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan. **New reports.** CU: Chemung. PERC: Chenango.

Hexagenia atrocaudata McDunnough

Previous reports. Traver (1931): Tompkins. Traver (1935): Erie, Monroe, Montgomery. Spieth (1941): Broome, Delaware. **New reports.** CSU: Warren. PERC: Allegany. USNM: Columbia.

Hexagenia bilineata (Say)

Previous reports. Needham (1901): Franklin. Needham (1920): Erie, Seneca, Tompkins. Needham (1928): Dutchess, Niagara, Schenectady, Warren. **New reports.** PERC: Clinton, Monroe. **Discussion.** Needham's reports of this species from New York lakes may actually be applicable to *H. limbata*.

Hexagenia limbata (Serville)

Previous reports. Needham (1901): Franklin. Morgan (1911): Tompkins. Needham (1928): Greene. Traver (1935): Montgomery, St. Lawrence, Warren, county unspecified [Cayuga L]. Spieth (1941): Clinton, Columbia, Niagara, Rockland. Clady (1975): county unspecified [Cayuga L]. Arbona (1980): Delaware or Sullivan. **New report.** CU: Essex.

Hexagenia rigida McDunnough

Previous reports. Traver (1935): Erie. Spieth (1941): Clinton, Essex, Niagara. **New reports.** EA: Franklin. PERC: Oneida.

Litobrancha recurvata (Morgan)

Previous reports. Morgan (1913): Tompkins. Needham (1928): Fulton, nec Herkimer. Traver (1935): Livingston. **New reports.** CU: Chemung. PERC: Wayne.

Discussion. Although not specified by Morgan (1913), the collecting site of her study material was the Cornell University campus (pers. comm., G. F. Edmunds, Salt Lake City, UT). Pine Lake, near Canada Lake, is in Fulton County, not Herkimer County, as reported by Needham (1928) and subsequently repeated by Traver (1935).

HEPTAGENIIDAE

Cinygmula subaequalis (Banks)

Previous reports. Traver (1935): Tompkins. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Oswego. CU: Chemung. NYSDEC: Monroe, Oneida.

Epeorus fragilis (Morgan)

Previous report. Morgan (1911): Tompkins.

New reports. CU: Chemung. PERC: Warren.

**Epeorus frisoni* (Burks)

New report. PERC: Tompkins Co., Enfield, 06-V-1932, adult.

Discussion. This represents the first report of *E. frisoni* since its description (Burks, 1946) from one locality in Maine. Adults have been taken in May (herein) and August (Burks, 1946).

Epeorus pleuralis (Banks)

Previous reports. Banks (1910): Fulton. Needham (1928): Richmond, Rockland. Traver (1935): Tompkins. Spieth (1938): counties unspecified [Catskill and Ramapo mountains, near New York City]. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Oswego, Hamilton. CU: Chemung.

Epeorus punctatus (McDunnough)

Previous report. Traver (1935): Erie.

Epeorus suffusus (McDunnough)

Previous reports. Traver (1935): Tompkins, Warren.

New report. CU: Saratoga Co, Corinth, 01-VI-1916, adult.

Discussion. In New York, this infrequently taken species has been reported from Corinth and from near Ithaca (Traver, 1935). It is also known from Quebec (Walley, 1927) and the Ottawa River in Ontario (McDunnough, 1925c). Adults are present in June.

Epeorus vitreus (Walker)

Previous reports. Morgan (1911): Tompkins. Traver (1935): Rensselaer, St. Lawrence.

New reports. CU: Chemung, Columbia. PERC: Chenango, Washington, Wyoming.

Heptagenia culacantha Evans, Botts and Flowers

Previous reports. Evans et al. (1985): Sullivan, Tioga.

New reports. NYSDEC: Clinton Co, Saranac R, 44°41'16"N, 73°27'29"W, 07-VII-1986, larvae; Orange Co, Woodbury Cr, 41°24'00"N, 74°04'56"W, 05-V-1987, larvae.

Discussion. This infrequently taken species, one of the largest and most striking North American heptageniids, is known only from Pennsylvania and New York. In New York, it was reported by Evans et al. (1985) from several localities on the Delaware River in Sullivan County and from the Susquehanna River at Barton. Larvae usually occur singly on the undersides of large objects in shallow water with swift current. Adults are present in May (Evans et al., 1985).

**Heptagenia flavescens* (Walsh)

New reports. NYSDEC: Clinton Co, Saranac R, 44°38'52"N, 73°44'49"W, 10-VIII-1993, larvae; Essex Co, West Branch Ausable R, 44°21'54"N, 73°50'38"W, 27-VII-1989, larvae; Fulton Co, Cayadutta Cr, 43°04'04"N, 74°24'29"W, 24-VII-1996, larvae; Jefferson Co, Black R, 43°59'05"N, 75°55'30"W, 15-VII-1982, larvae; Sullivan Co, Little Beaver Kill, 41°54'03"N, 74°49'46"W, 26-VII-1994, larvae; Ulster Co, Upper Esopus Cr, 42°02'48"N, 74°16'49"W, 27-VII-1995, larvae.

**Heptagenia julia* Traver

New report. PERC: Tompkins Co, Newfield, 25-VI-1933, J. R. Traver, larva.

Discussion. This represents an extension to the known range of *H. julia*, because it was previously only known from North Carolina (Traver, 1933), South Carolina (Traver, 1935), West Virginia (Faulkner and Tarter, 1977) and Georgia (Berner, 1977). Although seldom reported, Traver (1933) commented that this species was locally common in streams. Adults have been collected in July and August.

**Heptagenia marginalis* Banks

New reports. CU: St. Lawrence Co, E Br St. Regis R, 15-VII-1933, Harper, adult. NYSDEC: Erie Co, Buffalo Cr, 42°51'17"N, 78°45'17"W, 23-VIII-1994, larvae; Jefferson Co, Black R, 43°59'05"N, 75°55'30"W, 19-VIII-1992, larvae; Lewis Co, Black R, 43°40'37"N, 75°21'43"W, 13-VII-1982, larvae; Sullivan Co, Lower Neversink R, 41°43'48"N, 74°36'15"W, 20-VIII-1987, larvae; Ulster Co, West Branch Neversink R, 41°58'45"N, 74°29'10"W, 01-VII-1987, larvae.

Heptagenia pulla (Clemens)

Previous reports. Traver (1935): Cayuga, Erie, St. Lawrence, Tompkins.

New reports. CU: Niagara. PERC: Clinton.

Leucrocuta aphrodite (McDunnough)

Previous reports. Traver (1935): Herkimer, Montgomery, Steuben, Tompkins.

New reports. PERC: Wyoming, Livingston.

Leucrocuta hebe (McDunnough)

Previous reports. Traver (1935): Columbia, Greene, Herkimer, Montgomery, St. Lawrence, Schoharie, Tompkins. Arbona (1980): Delaware or Sullivan.

New reports. PERC: Ontario, Orleans, Wyoming.

Leucrocuta juno (McDunnough)

Previous reports. Traver (1935): Fulton, Tompkins.

New reports. CU: Chemung. PERC: Livingston, Wyoming.

Leucrocuta maculipennis (Walsh)

Previous reports. Needham (1905): Tompkins. Needham (1928): Fulton, Steuben.

New reports. CU: Rensselaer. PERC: Allegany, Livingston.

**Leucrocuta thetis* (Traver)

New report. CU: Chemung Co, McCorn Cr at Van Etten, 4-VI-1976, N. J. Lamb, larvae.

**Leucrocuta umbratica* (McDunnough)

New report. PERC: Tompkins Co, Newfield, 29-VI-1933, J. R. Traver, adults and larval exuviae.

**Nixe inconspicua* (McDunnough)

New report. CU: Tompkins Co, Ithaca, 1-VII-1935, J. R. Traver, adult.

Nixe lucidipennis (Clemens)

Previous report. Traver (1935): Tompkins.

Nixe rusticalis (McDunnough)

Previous report. Traver (1935): Tompkins.

Discussion. In New York, this seldom reported species has been taken from Enfield, Taughannock Glens, and Ithaca (Traver, 1935). It has also been reported from a few locales in Quebec (McDunnough, 1931), Saskatchewan (Whiting and Sheard, 1990), Iowa (Klubertanz, 1995), and Ohio (Traver, 1935; Randolph and McCafferty, 1998). Larvae are known to inhabit high gradient streams (Whiting and Sheard, 1990), and adults are present in July (McDunnough, 1931).

Rhithrogena amica Traver

Previous report. Traver (1935): Tompkins.

New report. PERC: Livingston.

Rhithrogena anomala McDunnough

Previous reports. Traver (1935): Clinton, St. Lawrence.

New report. CU: Onondaga Co, Syracuse, 09-VI-1933.

Discussion. This infrequently reported species is also known from Quebec (McDunnough, 1928), Virginia (Kondratieff and Voshell, 1983), Connecticut (Burian and Bednarik, 1994), and Alabama (Harris et al., 1996). In New York, it has been reported from Saranac and the St. Regis River at Ft. Jackson (Traver, 1935). Adults are present in June.

**Rhithrogena uhari* Traver

New report. PERC: Essex Co, Lewis, at Lee Bridge, 18-VI-1952, E. I. Coher, larvae.

Discussion. Records of this infrequently taken species have been from Alabama, Georgia, North Carolina, South Carolina (Berner, 1977) and Maine (Burian and Gibbs, 1991). Larvae inhabit the erosional areas and shallow pools of streams (Burian and Gibbs, 1991). In Georgia, adults have been collected in May (Berner, 1977).

**Stenacron candidum* (Traver)

New reports. CSU: Hamilton Co, West Stony Cr at Hwy 30, N Great Sacandaga L, 05-VI-1997, Kondratieff and Baumann, adults and larvae; Oswego Co, Salmon R, Hwy 13, SE Pulaski, 17-VI-1997, Kondratieff and Baumann, adults and larvae. PERC: Suffolk Co, Riverhead, 16-VII-1947, adults; Westchester Co, 19-VI-1936, H. K. Townes, adult.

Stenacron carolina (Banks)

Previous reports. Traver (1935): Rockland, St. Lawrence, Tompkins.

New reports. CU: Hamilton. UM: Orange.

**Stenacron gildersleevei* (Traver)

Previous report. Spieth (1947): counties unspecified.

New reports. UM: Greene Co, Lexington, 15-VI-1935, H. T. Spieth, adult; Orange Co, Tuxedo, 04-VI-1932, H. T. S., adult.

Discussion. The specimens reported here were collected by Herman Spieth, and thus likely represent the New York material to which he referred but for which he provided no record data (Spieth, 1947).

Stenacron interpunctatum (Say)

Previous reports. Eaton (1885): Herkimer, Oneida. Needham (1905): Tompkins. Needham (1928): Warren. Traver (1935): Columbia, Fulton, Monroe, Montgomery, Niagara, Rensselaer, St. Lawrence, Sullivan, county unspecified [West Caneville]. Lewis (1974): Broome. Arbona (1980): ?Delaware.

New reports. CU: Erie. NYSDEC: Chautauqua, Chemung, Clinton, Cortland, Jefferson, Lewis, Onondaga, Ontario, Orange, Orleans, Otsego, Putnam, Schoharie, Ulster, Washington, Wayne, Westchester. PERC: Albany, Allegany, Cattaraugus, Cayuga, Chenango, Tioga, Wyoming. WLS: Genesee, Livingston, Steuben. UM: Greene, Dutchess, Rockland.

Discussion. Figures and descriptions of Eaton's (1885) nymph number 1, collected in Niagara (Erie County) and Trenton Falls (Oneida County), are applicable to *S. interpunctatum*.

**Stenacron pallidum* Traver

New reports. PERC: Wyoming Co, East Koy Cr, 42°35'53"N, 78°06'17"W, 02-VIII-1999, L. M. Jacobus and R. P. Randolph, larva.

**Stenonema exiguum* Traver

Previous report. Bilger (1986): county unspecified.

New report. PERC: Livingston Co, Genesee R, 42°34'16"N, 78°02'25"W, 01-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae.

Stenonema femoratum (Say)

Previous reports. Banks (1910): Chautauqua. Needham (1928): Fulton. Traver (1935): Cattaraugus, Clinton, Hamilton, Monroe, Montgomery, Oneida, Tompkins.

New reports. CU: Erie. NYSDEC: Albany, Cayuga, Jefferson, Lewis, Niagara, Onondaga, Oswego, Otsego, Saratoga, Schenectady, St. Lawrence, Washington, Wayne. PERC: Chenango, Livingston. WLS: Genesee, Steuben.

Stenonema flaveolum (Pictet)

Previous report. Eaton (1871): Bronx.

Discussion. This species remains a nomen dubium (McCafferty and Bae, 1992).

Stenonema ithaca (Clemens and Leonard)

Previous reports. Clemens and Leonard (1924): Tompkins. Traver (1935): Cattaraugus, Fulton, Herkimer, Montgomery, Oneida, Rensselaer, St. Lawrence, Schoharie.

New reports. CSU: Oswego. NYCDEP: Greene. NYSDEC: Erie, Oswego, Steuben, Suffolk, Sullivan, Ulster, Washington. UM: Greene, Orange.

**Stenonema luteum* (Clemens)

New reports. NYSDEC: Essex Co, Saranac R, 44°24'05"N, 74°02'07"W, 18-VIII-1998, larvae. PERC: Allegany Co, Genesee R, 42°13'26"N, 78°01'51"W, 02-VIII-1999, L. M. Jacobus and R. P. Randolph, larvae; Onondaga Co, mouth of Pea Hawk Cr at Seneca R, 43°09'17"N, 76°25'34"W, L. M. Jacobus and R. P. Randolph, larvae.

Stenonema mediopunctatum (McDunnough)

Previous reports. Traver (1935): Herkimer, St. Lawrence, Suffolk, Tompkins. Lewis (1974): Erie.

New reports. MCZ: Onondaga. NYSDEC: Albany, Cattaraugus, Chautauqua, Chemung, Chenango, Clinton, Cortland, Jefferson, Lewis, Monroe, Orange, Oswego, Otsego, Sullivan, Tioga, Washington, Yates. PERC: Allegany, Livingston, Wyoming. WLS: Steuben.

**Stenonema meririvulanum* Carle and Lewis

New reports. PERC: Cattaraugus Co, Spring Run, Blacksnake Mountain, Allegany State Park, 28-V-1981, larvae, W. K. Gall. NYSDEC: Greene Co, Shanty Hollow Brook, 42°12'03"N, 74°12'45"W, 22-VIII-1990; larvae.

**Stenonema mexicanum* (Ulmer)

Previous report. Bilger (1986): county unspecified.

New reports. NYSDEC: Livingston Co, Genesee R, 42°55'04"N, 77°45'26"W, 24-VII-1980, larvae; Monroe Co, Genesee R, 43°07'13"N, 77°38'49"W, 14-VII-1993, larvae.

Stenonema modestum (Banks)

Previous reports. Traver (1935): Montgomery, St. Lawrence, Tompkins. Bednarik and McCafferty (1979): Rensselaer. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Warren. NYSDEC: Broome, Cattaraugus, Chemung, Columbia, Cortland, Delaware, Dutchess, Greene, Herkimer, Jefferson, Lewis, Orange, Oswego, Otsego, Putnam, Rockland, Saratoga, Suffolk, Sullivan, Tioga, Ulster, Washington, Westchester, Wyoming. PERC: Allegany, Livingston, Tompkins.

Stenonema pudicum (Hagen)

Previous reports. Traver (1935): Tompkins. Bednarik and McCafferty (1979): Putnam.

New reports. PERC: Allegany, Livingston. UM: Rockland, Orange.

Discussion. A description and figures of Eaton's (1885) nymph number 2, collected near Niagara Falls (Niagara County), are applicable to *S. pudicum*.

Stenonema pulchellum (Walsh)

Previous reports. Needham (1901): Franklin. Banks (1910): Chautauqua, Fulton. Needham (1928): Cayuga, Herkimer, Tompkins, Warren. Arbona (1980): Delaware or Sullivan.

New reports. NYSDEC: Albany, Chemung, Essex, Jefferson, Monroe, Otsego, Rensselaer, Steuben, Tioga. PERC: Livingston, Wyoming. UM: Niagara.

Stenonema terminatum (Walsh)

Previous reports. Banks (1910): Fulton. McDunnough (1926): Niagara. Lewis (1974): Broome.

New reports. CU: Tompkins. NYSDEC: Albany, Broome, Cattaraugus, Chemung, Columbia, Cortland, Delaware, Erie, Greene, Jefferson, Lewis, Monroe, Oneida, Orange, Otsego, Rensselaer, Saratoga, St. Lawrence, Steuben, Tioga, Ulster, Washington, Wyoming. PERC: Livingston, Genesee. WLS: Steuben.

Discussion. New York represents an overlap zone for the more eastern subspecies *S. t. placitum* (Banks) and the more western subspecies *S. t. terminatum* (Bednarik and McCafferty, 1979).

Stenonema vicarium (Walker)

Previous reports. Needham (1901): county unspecified. Traver (1935): Schuyler, Tompkins. Lewis (1974): Fulton. Caucci and Nastasi (1975): counties unspecified. Bednarik and McCafferty (1979): Oneida. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Oswego. CU: Schenectady. MCZ: Broome. NYSDEC: Albany,

Allegany, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Greene, Jefferson, Lewis, Livingston, Madison, Montgomery, Onondaga, Ontario, Orange, Otsego, Saratoga, Schoharie, St. Lawrence, Tioga, Ulster, Warren, Washington, Wyoming. PERC: Rensselaer. WLS: Genesee, Monroe, Steuben. UM: Hamilton, Sullivan, Rockland.

ISONYCHIIDAE

†*Isonychia arida* (Say)

Previous reports. Needham (1928): county unspecified.

Isonychia bicolor (Walker)

Previous reports. Needham (1905): Tompkins. Needham (1928): Fulton. Traver (1934): St. Lawrence, Tioga. Traver (1935): Columbia, Montgomery, Rensselaer, Schoharie. Kondratieff and Voshell (1984): Niagara, Onondaga, Rockland, Sullivan, Ulster.

New reports. CSU: Hamilton, Oswego, Warren. CU: Chemung. NYSDEC: Albany, Cattaraugus, Cayuga, Chautauqua, Clinton, Dutchess, Erie, Essex, Franklin, Genesee, Greene, Herkimer, Jefferson, Lewis, Madison, Monroe, Oneida, Ontario, Orange, Orleans, Otsego, Putnam, Saratoga, Steuben, Washington, Westchester, Yates. PERC: Allegany, Broome, Chenango, Cortland, Delaware, Livingston, Wyoming.

**Isonychia obscura* Traver

New reports. NYSDEC: Essex Co, W Br Ausable R, 44°19'20"N, 73°54'49"W, 27-VII-1989, larvae; Fulton Co, Kenyetto Cr, 43°03'31"N, 74°13'26"W, 05-VII-1994, larvae; Greene Co, 42°12'04"N, 74°12'09"W, 28-VI-1995, larvae; Lewis Co, Balsam Cr, 43°57'09"N, 75°20'23"W, 17-IX-1996, larvae; Warren Co, Upper Hudson R, 43°39'42"N, 73°53'55"W, 06-VII-1994, larvae.

LEPTOHYPHIDAE

Tricorythodes allectus (Needham)

Previous reports. Needham (1905): Tompkins. Needham (1908b): Herkimer.

Tricorythodes minutus Traver

Previous report. Traver (1935): Tompkins.

New reports. NYCDEP: Putnam. PERC: Allegany, Wyoming.

**Tricorythodes stygiatus* McDunnough

Previous report. Arbona (1980): Delaware or Sullivan.

New report. CU: Tompkins Co, Cascadilla Cr, Cornell Fish Hatchery, 16-VII-1931, adults.

LEPTOPHLEBIIDAE

Choroterpes basalis (Banks)

Previous reports. Needham (1905): Tompkins. Needham (1908b): Herkimer. Needham (1928): Warren. Burian (1995): Hamilton.

Habrophlebia vibrans Needham

Previous reports. Needham (1908b): Herkimer. Traver (1935): St. Lawrence, Washington.

New reports. NYSDEC: Greene. PERC: Hamilton.

Habrophlebiodes americana (Banks)

Previous reports. Needham (1908b): Erie or Greene [Hamburg]. Morrison (1919): Tompkins. Needham (1928): Steuben. Traver (1935): Cortland, St. Lawrence.

Leptophlebia cupida (Say)

Previous reports. Eaton (1884): Bronx. Morgan (1911): Tompkins. Needham (1908b): Herkimer. Needham (1928): Richmond, Suffolk, Wyoming. Traver (1935): Tioga. Caucci and Nastasi (1975): Schoharie.

New report. CU: Putnam, Rockland.

Leptophlebia johnsoni McDunnough

Previous report. Traver (1935): St. Lawrence.

Leptophlebia nebulosa (Walker)

Previous reports. Eaton (1871): county unspecified [Albany R]. Needham (1928): Fulton.

New reports. CU: Oswego, Tompkins, county unspecified [Cayuga L]. PERC: Hamilton.

Paraleptophlebia adoptiva (McDunnough)

Previous reports. Gordon (1933): Tompkins. Traver (1935): Cortland. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Oswego. CU: Rockford. PERC: Hamilton.

Paraleptophlebia debilis (Walker)

Previous reports. Eaton (1884): Bronx. Needham (1908b): Herkimer. Gordon (1933): Tompkins. Arbona (1980): Delaware or Sullivan.

New report. CU: Chemung.

Paraleptophlebia guttata (McDunnough)

Previous reports. Gordon (1933): Tompkins. Traver (1935): Fulton, Herkimer, Schoharie.

New reports. NYSDEC: Greene, Sullivan, Washington. CU: Chemung, St. Lawrence. PERC: Wyoming.

Paraleptophlebia moerens (McDunnough)

Previous report. Gordon (1933): Tompkins.

New report. NYSDEC: Delaware.

Paraleptophlebia mollis (Eaton)

Previous reports. Hagen (1861) and Eaton (1871): Bronx. Morgan (1911): Tompkins. Needham (1928): Herkimer, Warren. Gordon (1933): Tioga. Traver (1935): Oneida, St. Lawrence. Arbona (1980): Delaware or Sullivan.

New reports. CSU: Oswego. CU: Chemung. NYCDEP: Ulster. NYSDEC: Broome, Cayuga, Cortland, Delaware, Essex, Franklin, Greene, Hamilton, Rensselaer, Sullivan, Washington.

Paraleptophlebia ontario (McDunnough)

Previous report. Traver (1935): Schuyler or Steuben [Cinnamon Lake].

New report. PERC: Chenango.

Paraleptophlebia praepedita (Eaton)

Previous reports. Morgan (1911): Tompkins. Gordon (1933): Cortland, Tioga.

New report. CU: Clinton.

**Paraleptophlebia volitans* (McDunnough)

New reports. CU: Sullivan Co, Roscoe, 26-VII-1935, H. K. Townes, larvae. NYCDEP: Ulster Co, tributary of Ashokan Reservoir, 41°58'29"N, 74°11'59"W, 06-VII-1994.

METREPODIDAE

Siphloplecton basale (Walker)

Previous reports. Needham (1928): Cayuga. Traver (1935): Herkimer, St. Lawrence.

POLYMITARCYIDAE

Ephoron album (Say)

Previous reports. Eaton (1883): county unspecified. Needham (1905): county unspecified. Morgan (1911): Tompkins. Needham (1920): Steuben.

Discussion. Alate stages of *E. album* and *E. leukon* cannot be differentiated, and only eggs show consistent differences. Historical reports of the two may be confused because *E. album* is sympatric with *E. leukon* in much of the Midwest and East (McCafferty, 1994).

Ephoron leukon Williamson

Previous report. McDunnough (1926): Oswego.

Discussion. This species is expected to be more widespread in New York than indicated (see Discussion under *E. album*).

POTAMANTHIDAE

Anthopotamus distinctus (Traver)

Previous reports. Traver (1935): Herkimer. Caucci and Nastasi (1975): counties unspecified. Arbona (1980): Delaware or Sullivan.

Anthopotamus myops (Walsh)

Previous reports. Needham (1908a): Schenectady. Argo (1927): Steuben, Tompkins. Traver (1935): Montgomery. Bae and McCafferty (1991): Albany, Otsego.

Anthopotamus neglectus (Traver)

Previous reports. Traver (1935): Tompkins. Bae and McCafferty (1991): ?Oneida [Etica].

Anthopotamus verticis (Say)

Previous reports. Eaton (1885): Bronx. Needham (1908b): Erie. Needham (1920): Tompkins. McDunnough (1926): Schenectady. Needham (1928): Herkimer. Traver (1935): Oswego.

SIPHONURIDAE

Siphonisca aerodromia Needham

Previous report. Needham (1908a): Fulton.

Discussion. This infrequently reported species is also known from Labrador (Fiance, 1978), Maine (Gibbs, 1980), and Quebec (Magnin and Harper, 1970; Hutchinson, 1989). Larvae have been found in inundated floodplains, and adults are present in May and June (Gibbs and Mingo, 1986). A New York population of *S. aerodromia* has been located in Lewis County, on the Black River, across the road from the Beaches Landing Boat Launch (pers. comm., Chris Fishel, St. Lawrence County, NY).

Siphonurus alternatus (Say)

Previous reports. Walker (1853): Oneida. Needham (1901): Franklin. Needham (1908b): Herkimer. Morgan (1911): Tompkins. Needham (1928): Fulton. Traver (1935): Rensselaer, St. Lawrence.

New report. CSU: Warren.

Siphonurus barbaroides McDunnough

Previous report. Traver (1935): Tompkins.

Siphonurus barbarus McDunnough

Previous report. McDunnough (1924b): Ulster.

Discussion. In New York, this infrequently taken species has been reported from Big Indian Valley in the Catskill Mountains (McDunnough, 1924b). It has also been reported from single locales in Nova Scotia (McCafferty and Randolph, 1998) and Quebec (McDunnough, 1932). At the latter location, the larvae of this species and *S. quebecensis* were cohabiting the same stream. Adults have been collected in June.

Siphonurus mirus Eaton

Previous report. Clemens (1915): Fulton.

New report. PERC: Hamilton.

†*Siphonurus noveboracana* (Lichtenstein)

Previous report. Lichtenstein (1796): county unspecified.

Discussion. This, the first reported mayfly species from North America, remains a nomen dubium (Edmunds and Allen, 1957).

Siphonurus quebecensis (Provancher)

Previous reports. Clemens (1915): Tompkins. Traver (1935): St. Lawrence, Washington. Arbona (1980): counties unspecified.

New reports. CSU: Oswego. CU: Franklin. PERC: ?Schuyler [Cayula].

Siphonurus rapidus McDunnough

Previous report. Traver (1935): Washington.

New reports. CU: Monroe. PERC: Fulton, Tompkins.

Siphonurus typicus Eaton

Previous reports. Needham (1928): Fulton. Traver (1935): Cattaraugus, Sullivan.

New report. CU: Tompkins.

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