

STENONEMA MAYFLY RECORDS FOR KANSAS

by

Paul M. Liechti

In North America the genus Stenonema Traver is composed of 24 species, two subspecies, and possibly two undescribed species (Edmunds, Jensen, and Berner, 1976). Collections made by the State Biological Survey since 1971 have yielded nine species, two of which may be divided into subspecies (this taxonomic problem will be discussed later). In the United States all but the one or two undescribed species occur east of the Rocky Mountains. Kansas, then, represents the western extent of distribution for the genus and the number of species for the state will probably not exceed those nine species now known by more than three. It can be noted from the Kansas records listed herein, that western distribution boundaries for many of the species are quite noticeable. These distributions are closely related to, if not dependent on, the habitat that changes from eastern to western Kansas.

The species of Stenonema are primarily found in flowing water as are most species in the family Heptageniidae. One exception is Stenonema tripunctatum, which is occasionally found in ponds and lakes where wave action increases oxygen levels along shorelines. In both flowing and still water the nymphs of Stenonema can be found under rocks and on other solid structures. They demonstrate thigmotactic and photonegative behavioral responses and orient their bodies in a manner which reduces resistance to stream flow. Lewis (1974) lists the species of Stenonema with their varying degree of pollution tolerance to decomposable organic wastes. Pollution tolerance of the species known to be found in Kansas varies from nearly tolerant to intolerant making them potentially useful in assessing water quality.

The systematics of Stenonema has been particularly confusing until recently. Lewis (1974) made a very good attempt at revising the genus and solved many of the taxonomic problems, but there are still species or species groups that need more study. Another contribution was made by Jensen (1974) when he split out the interpunctatum group of Lewis and gave it generic status under the name Stenacron. Of those Stenonema in Kansas the most difficult to distinguish are those in the femoratum group. The common species are S. femoratum and S. tripunctatum with S. tripunctatum divided into the subspecies S. t. tripunctatum and S. t. scitulum. The most prevalent appears to be the subspecies S. t. scitulum, however,

subspecific determination has not been made in the following account due to overlap of morphological characters of female nymphs of S. femoratum, subsequently reared, with nymphs of S. t. scitulum. Also a high degree of variability within as well as between the two species made subspecific designation less tenable at this time. The only other two subspecies in the genus are more morphologically distinct. Stenonema integrum integrum has been found in Kansas as well as the eastern half of the United States while S. i. wabasha has only been found in the northern areas of the midwest.

Identification of Stenonema was achieved by using Edmunds, Jensen, and Berner (1976), Burks (1953) and Lewis (1974). Flowers and Hilsenhoff (1975) key to the Heptageniidae of Wisconsin was referred to occasionally. The majority of the material reported on was nymphal. Although determinations of nymphal Stenonema are somewhat less reliable than adult male material, the author feels secure in the identifications with the exceptions of the aforementioned S. femoratum group and one or two species in the S. pulchellum group. Complete locality information is given for those species which have been recorded in ten or less counties while only a list of counties follows the more prevalent species.

Stenonema ares Burks, 1953

Nymphs

CHEROKEE Co: Spring River, 2.0 mi W Crestline at K96 hwy bridge, 12 Apr 1977, S. Hamilton; DOUGLAS Co: Wakarusa River, 1.5 mi W, 0.5 mi N Clinton, 3 Apr 1976, M. Gunter; FRANKLIN Co: Marais des Cygnes River, 1.5 mi N Rantoul, 30 Dec 1975, D. Huggins and P. Liechti; GEARY Co: Lyon Creek, 0.6 mi W, 0.8 mi S Wreford at K77 hwy bridge, 2 Jun 1976, S. Hamilton; MIAMI Co: Marias des Cygnes River, 0.25 mi NE Osawatomie, 6 Aug 1976, S. Hamilton; WILSON Co: Verdigris River, 0.3 mi N, 0.5 mi W Benedict, 30 Jul 1974, G. Lessenden.

This species is, herein, tentatively added to the state mayfly list. Only nymphs were found which gives one the indication that perhaps the identifications are in error. This is possibly true because of nymphal similarities between Stenonema ares, S. bipunctatum, S. pulchellum and faded specimens of S. quinquespinum. The author feels the above nymphal material does not fit with any other Stenonema and conforms more closely to the nymphs of S. ares as described by Lewis (1974). Lewis (1974) shows its occurrence in Illinois and Indiana with the mention of possible populations in Wisconsin but Flowers and Hilsenhoff (1975) make no mention of this species. This account indicates a southwestern range extension of approximately 400 miles. Reared material and adult collections are necessary for more positive identification and range extension verification.

Stenonema exiguum Traver, 1933

Nymphs

CHAUTAUQUA Co: Big Caney River, 0.6 mi E Cedarvale, 22 Apr 1976, P. Liechti and D. Huggins; CHEROKEE Co: Shoal Creek, 1.3 mi S Galena, 12 Apr 1977,

T. Oldham; COFFEY Co: Neosho River at Burlington, 14 Mar 1974, G. Lessenden; LINN Co: Marais des Cygnes Wildlife Refuge at river N US hwy 69, 4 Aug 1976, S. Hamilton and T. Oldham; MONTGOMERY Co: Verdigris River, 2.1 mi S, 1.8 mi E Coffeyville.

These are the first records for the species in Kansas. Its previous distribution was the Southeastern U. S. with some accounts from Minnesota, Michigan and Wisconsin. It appears that Stenonema exiguum is limited to the southeast one-fourth of the state and will probably not be found outside of this area. Again only nymphal material was available for study and adults are needed for cooperating determination. The nymphs, however, are rather distinctive and can only be confused with S. quinquespinum which is also present in Kansas but following the key of Lewis (1974) the two species can be readily separated.

Stenonema femoratum (Say, 1823)

Nymphs

BOURBON Co: Marmaton River, 2.0 mi NE Ft. Scott, 4 Aug 1976, T. Oldham; CHEROKEE Co: Spring River, 20 Apr 1974, D. Huggins; COFFEY Co: unnamed creek, 4.0 mi N, 1.5 mi W Strawn, 5 Jun 1975, T. Edmonds; CRAWFORD Co: Lake Crawford State Park NE Farlington, 11 Apr 1977, S. Hamilton and T. Oldham; RILEY Co: Otter Creek, 2.0 mi N, 2.6 mi E Lasita; WABAUNSEE Co: Dragon Creek, 0.3 mi N Harveyville, 23 Oct 1974, E. Martinko.

Adults

DOUGLAS Co: Rock Creek, 3.0 mi W, 4.5 mi S Clinton, 16 Feb 1974, D. Huggins; ELK Co: Howard City Lake, 22 Apr 1976, D. Huggins and P. Liechti.

This common species has an expected distribution that includes eastern Kansas. These records confirm the expectation. Stenonema femoratum is often found sympatrically with S. tripunctatum which it resembles in its immature stages. One should use extreme care in identifying young instars because of this similarity. Female nymphs of S. femoratum and S. tripunctatum scitulum appear to have overlapping morphological characters, making placement even more difficult. Many of the above records are from reared specimens.

Stenonema integrum integrum (McDunnough, 1924)

Nymphs

ALLEN, DONIPHAN, DOUGLAS, ELLIS, ELLSWORTH, GEARY, JEFFERSON, JOHNSON, KINGMAN, LEAVENWORTH, MARSHALL, MIAMI, MITCHELL, OSBORNE, RENO, REPUBLIC, RUSSELL, SUMNER, WASHINGTON, and WOODSON counties.

Adults

DOUGLAS Co: Storefront lights, downtown Lawrence, 25 Jul 1977, P. Liechti and D. Huggins.

Stenonema integrum has been previously reported from the Kansas River, Lawrence by Lewis (1974). Both Lewis (1974) and Edmunds, et. al. (1976) list two subspecies, S. i. integrum and S. i. wabasha, but Lewis does not distinguish the two in his key. However, using the written description and the differing distributions of the two subspecies given by Lewis (1974)

the Kansas specimens were identified as S. i. integrum. This species is one of the more pollution tolerant mayflies and prefers larger rivers although it may inhabit any permanent stream. This Stenonema has the furthest west Kansas distribution of any in the genus except S. pulchellum. The two species were found sympatrically in the Smoky Hill River in Ellis County in the western extent of their distribution.

Stenonema nepotellum (McDunnough, 1933)

Nymphs

CHEROKEE Co: Spring River, 2.0 mi E Crestline at K96 hwy bridge, 20 Jul 1977, P. Liechti and D. Huggins.

This species has been taken from Shoal Creek in Missouri, but has not been taken from that creek in Kansas. Although Lewis (1974) comments on the similarity between S. nepotellum and a more northern species S. medio-punctatum, the Kansas specimens conform closely to the description of S. nepotellum.

Stenonema pulchellum (Walsh, 1862)

Nymphs

BOURBON, BUTLER, CHAUTAUQUA, CHEROKEE, ELLIS, FRANKLIN, GEARY, GREENWOOD, LABETTE, MIAMI, NEOSHO, and WOODSON counties.

Stenonema pulchellum is another species that is relatively tolerant of organic pollution (see discussions of S. integrum integrum). Its Kansas distribution is primarily eastern with one population found inhabiting the Smoky Hill River in Ellis County.

The nymphs of this species are easily determined with only some confusion of pale specimens with those of S. exiguum. Lewis (1974) discussed problems separating S. pulchellum and S. rubrum adults. Stenonema rubrum has not yet been found in Kansas, but could possibly be found in the future, since its known habitats are similar to S. pulchellum and its known distribution parallels Stenacron interpunctatum canadense (Lewis, 1974), a common Kansas species.

Stenonema quinquespinum Lewis, 1974

Nymphs

ALLEN Co: Neosho River, 0.5 mi W Humboldt, 11 May 1976, P. Liechti and D. Huggins; CHAUTAUQUA Co: Buzzard Creek, 1.0 mi S, 2.5 mi E Hewins, 3 Aug 1977, S. Hamilton; CHEROKEE Co: Shoal Creek, 1.3 mi S Galena, 16 Sep 1976, P. Liechti and D. Huggins; GEARY Co: Clark Creek, 5.0 mi E, 5.0 mi S Junction City, 11 May 1977, T. Oldham; KINGMAN Co: Chikaskia River, 1.5 mi W Spivey, 18 Jul 1976, S. Hamilton; MIAMI Co: North Wea River, 5.5 mi W Louisburg, 4 Apr 1974, D. Huggins; MONTGOMERY Co: Verdigris River, 1.0 mi S, 1.0 mi E Coffeyville, 27 Dec 1976, P. Liechti and D. Huggins.

Only scattered populations have been found in the eastern half of the state. The species has been found in streams that were affected by agricultural runoff but appears to be replaced by Stenonema pulchellum in more

polluted waters such as below sewage discharges (Lewis, 1974). Stenonema quinquespinum has a distribution from Georgia to Wisconsin and now westward into Kansas.

Lewis (1974) uses thoracic coloration for partial separation of species near S. quinquespinum but this character becomes difficult to rely on due to fading when specimens are preserved in alcohol.

Stenonema terminatum (Walsh, 1862)

Nymphs

COFFEY Co: Neosho River at Burlington, 14 Mar 1974, G. Lessenden; DICKINSON Co: Cary Creek, 0.8 mi W, 0.8 mi N Lyona, 11 Jun 1976, S. Hamilton; ELK Co: Elk River, 1 mi E, 1 mi S Longton, 2 Aug 1977, S. Hamilton; FRANKLIN Co: Marais des Cygnes River, 1.5 mi N Rantoul, 23 Jan 1976, P. Liechti; GEARY Co: Lyon Creek, 0.6 mi W, 0.8 mi S Wreford at K77 hwy bridge, 2 Jun 1976, S. Hamilton; JEFFERSON Co: Delaware River, 0.3 mi W Halfmound, 6 Jan 1976, D. Huggins and P. Liechti; OSBORNE Co: South Fork Solomon River, 1 mi S Bloomington, 6 Jul 1977, S. Hamilton; SUMNER Co: Chikaskia River, 0.4 mi W Drury, 14 Jul 1976, S. Hamilton; WILSON Co: Verdigris River, 0.3 mi N, 0.5 mi W Benedict, 30 Jul 1974, G. Lessenden; WOODSON Co: Neosho River at Neosho Falls, 6 Aug 1975, T. Edmonds.

The only species closely resembling Stenonema terminatum is as yet unnamed and known only from the western areas of the U. S. and Canada. The Kansas specimens are reasonably similar to S. terminatum and the collection of specimens only from the eastern half of the state helps substantiate the determinations. The above records are the first for the species in Kansas.

Stenonema tripunctatum Banks, 1910

Nymphs

ANDERSON, ATCHISON, BUTLER, CHAUTAUQUA, CHEROKEE, COFFEY, DICKINSON, GREENWOOD, JACKSON, JEFFERSON, LABETTE, LEAVENWORTH, LINN, LYON, MARION, MARSHALL, MIAMI, MONTGOMERY, MORRIS, NEOSHO, OSAGE, SEDGWICK, SHAWNEE, WABAUNSEE, WILSON, and WYANDOTTE counties.

Adults

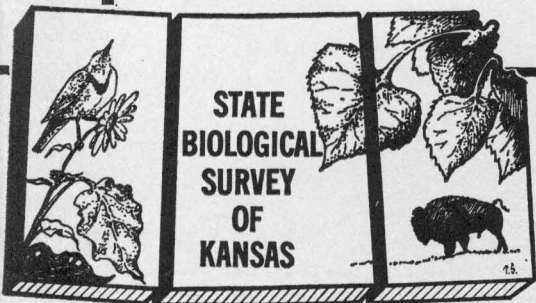
ALLEN, BOURBON, BROWN, CHASE, COWLEY, CRAWFORD, DOUGLAS, ELK, FRANKLIN, GEARY, NEMARA, POTTAWATOMIE, RILEY, and WOODSON counties.

This is the most common and locally abundant Stenonema species in Kansas and has been found inhabiting lake and pond shorelines that experience some wave action. Both Burks (1953) and Lewis (1974) list previous records from Kansas as well as the neighboring states of Arkansas, Iowa, Missouri, and Oklahoma. There has been no subspecific determination made at this point (see introduction), but the author feels that only S. t. scitulum (after Lewis, 1974) is present in the state. A continuing controversy still exists regarding subspeciation in S. tripunctatum. Until this controversy is concluded or enough reared Kansas material has been gathered to delimit taxonomic status within the state, only the species name will be used to describe the appropriate specimens.

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Michael Hubbard



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