

THE CHECKLIST OF MAYFLIES (INSECTA: EPHEMEROPTERA) OF LITHUANIA

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Abstract. A checklist of 60 mayfly species of Lithuania is presented. It was compiled on the basis of 17 publications and includes two new species for the Lithuanian fauna – *Baetis buceratus* Eaton, 1870 and *B. calcaratus* Keffermuler, 1972.

Key words: checklist, Ephemeroptera, Lithuania

INTRODUCTION

Mayflies of Lithuania are comparatively well studied. The first list including 33 species was published in 1917 (Ulmer *et al.* 1917).

The most extensive survey reporting 62 species of Lithuanian mayflies was carried out by Kazlauskas (1959, 1968) from 1959 to 1968. Some additional data on the mayfly fauna were published later (Kazlauskas 1976, 1977; Kluge & Novikova 1992; Kluge 1997).

However, all published material on mayfly species found in Lithuanian waters includes a lot of cases when the same species is reported under synonymous names. Some of the reported identifications are also doubtful. Thus, the purpose of this paper is to summarize all published information on the Lithuanian mayfly fauna and to present a comprehensive list of its species. This work also includes the author's recent studies of mayflies conducted mainly in western Lithuania.

SPECIES LIST

This work summarizes the data on mayflies that have been published since 1917. It also includes two mayfly species that are new for the Lithuanian fauna (N. J. Kluge, unpublished data). The list follows the rules of the International Code of Zoological Nomenclature. Species classification and nomenclature were based on the database Fauna Europea (www.faunaeur.org). Families and species are given in alphabetical order. The list of Lithuanian mayflies is presented in Table 1. It includes the species found in 64 localities during 1956–2004 (Fig. 1, Annex 1). The present list includes 60 species among which the species – *Baetis calcaratus* Keffermu-

ler, 1972 and *B. buceratus* Eaton, 1870 – were not reported before. The material is deposited in the Zoological Museum of Vilnius University, Zoological Institute of the Russian Academy of Sciences (St. Petersburg), and the author's private collection.

A few other mayfly species have been reported in literature, however they seem to be misidentifications as their presence in Lithuania is unlikely. The species *Arthroplea congener* Bengtsson, 1908 (Arthropleidae) reported by Kazlauskas (1968) has a circumarctic distribution and occurs only in a few mountainous regions of Central Europe. The species *Baetis macani* Kimmins, 1957 (Kazlauskas 1968) also with circumarctic distribution inhabits only stagnant tundra lakes (Kluge 1997). The species *Ecdyonurus venosus* (Fabricius, 1775) (Bubinas & Jagminienė 2001; Pliūraitė 2001a; Pliūraitė 2001b; Bubinas & Jagminienė 2002; Virbickas & Pliūraitė 2002; Pliūraitė & Kesminas 2004) and *Oligoneuriella rhenana* (Imhoff, 1852) (Kazlauskas 1959) occur in mountainous areas of Europe (Bauernfeind & Moog 2000; N. J. Kluge, pers. comm.). The presence of *Centroptilum pennulatum* Eaton, 1870 in Lithuania reported on larvae (Kazlauskas 1959) is also uncertain. According to N. J. Kluge (pers. comm.), all the reports of *C. pennulatum* from the East European Plain probably are erroneous. Likely, this species was confused with *C. pulchrum*, as larvae of both the species are very similar and frequently indistinguishable. Therefore, *C. pennulatum* was not included into the present list of Lithuanian mayflies. Finally, *O. pallida* (Hagen, 1855) = *O. mikulskii* Sowa, 1961 (Kazlauskas 1968) also is not likely to occur in Lithuania as it the only transpaleartic oligoneuriid species inhabiting plain mesosaprobic rivers (N. J. Kluge, pers. comm.).

Table 1. The list of mayfly species found in Lithuania. Synonymous names are given in angle brackets. Abbreviations: R (river), S (stream), L (lake), C (Curonian Lagoon), l. (larvae). References: (1) Gasiūnas 1959, (2) Kazlauskas 1959, (3) Kazlauskas 1962, (4) Kazlauskas 1964, (5) Kazlauskas 1965, (6) Kazlauskas 1968, (7) Kazlauskas 1976, (8) Kazlauskas 1977, (9) Kluge & Novikova 1992, (10) Kluge 1997, (11) Kluge, unpublished data, (12) recent study.

Family	Species	Locality, date, specimens and references
Ametropodidae	<i>Ametropus fragilis</i> Albarda, 1878 [<i>A. eatoni</i> Brodsky, 1930]	R: Neris, Nemunas stretch: Druskininkai–Strėva mouth, 26 September 1964 (6).
Baetidae	<i>Acentrella inexpectata</i> (Tshernova, 1928) [<i>Pseudocloeon inexpectata</i> Tshernova, 1928]	R: Neris: Nemenčinė, 7 July 1957, 11 ♂; Neris: Rykantai, 8 September 1957, 2 ♀ (2).
	<i>Baetis atrebatinus</i> Eaton, 1870	R: Nemunas: Birštonas, 8 June 1957, 5 ♂; Neris: Nemenčinė, 7 July 1957, 2 ♂ (2).
	<i>B. buceratus</i> Eaton, 1870	R: Neris: Vilnius, 22–29 June 1988, 1 ♂ (11).
	<i>B. calcaratus</i> Keffermuler, 1972	R: Neris: Vilnius, 15–17 June 1988, 6 ♂ 6 ♀ (11).
	<i>B. digitatus</i> Bengtsson, 1912	R: Nemunas (3).
	<i>B. fuscatus</i> (Linnaeus, 1761) [<i>B. bioculatus</i> (Pictet)] [<i>B. venustus</i> Eaton, 1885]	R: Mera, Salantas, Neris: Nemenčinė, 7 July 1957, 1 ♂; Salantas, 31 July 1957, 1 ♂; S: Karklė; Peršokšna (2). R: Nemunas (6).
	<i>B. muticus</i> (Linnaeus, 1758) [<i>Baetis pumila</i> Burmeister, 1839]	R: Nemunas, Neris, Verknė, Dubysa, Vokė, Žeimena, Ūla, Mera, Šešuvis, Salantas, Varduva; S: Grūda, Saria, Peršokšna, Karklė, Tvarkantė, Lapišė (2). Veržuva: Ž. Veržuva, 28 April 2004, 1 ♂ (12).
	<i>B. niger</i> (Linnaeus, 1761)	S: Saria, 7 July 1956, 1 ♂ (2).
	<i>B. rhodani</i> (Pictet, 1843)	S: Karklė, 3 March 1955, 1 subimago; Pilaitė, Peršokšna, Grūda (2). R: Nemunas, Neris (6).
	<i>B. scambus</i> Eaton, 1870	R: Nemunas, 18 June 1957, 1 ♂; Neris: Nemenčinė, 7 July 1957, 2 ♂; Verknė, 19–20 June 1957, 1 ♂, 1 ♀ (2). C: Ventė cape (6).
	<i>B. tricolor</i> Tshernova, 1928	R: Nemunas, Neris (6).
	<i>B. vernus</i> Curtis, 1834	R: Nemunas, Neris, Verknė, Dubysa, Vokė, Žeimena, Ūla, Mera, Šešuvis; S: Saria, Karklė, Grūda, Peršokšna (2).
	<i>Baetopus wartensis</i> Keffermuler 1960	R: Nemunas: Ryliškiiai, 24 June 1959, 26 ♂, 6 l.; Nemunas: Vilkija, 28 July 1959, 2 l.; Neris: Vilnius, 12 August 1959, 1 ♂, 16 June 1960, 3 ♀; Šventoji: Svėdasai, 17 July 1961, 3 ♂; Šešuvis: Tauragė, 11 August 1958, 4 ♂ (5).
	<i>Centroptilum luteolum</i> (Müller, 1776)	R: Nemunas, Neris, Verknė, Dubysa, Vokė, Žeimena, Ūla, Šešuvis, Šaltuona, Salantas, Varduva; S: Mūkė, Tvarkantė, Lapišė, Upė, Grūda, Kiršinas, Peršokšna, Karklė; L: Skaistis (2).
	<i>Cloeon dipterum</i> (Linnaeus, 1761) [<i>Cloeon rufulum</i> Müller, 1776]	L: Skaistis; S: Kulautuva, Peršokšna, Pilaitė; R: Neris, Verknė (2). R: Nemunas (8).
	<i>C. simile</i> Eaton, 1870	R: Dubysa, Mituva, Varduva, Salantas; S: Mūkė (2). Nemunas washes (6).
	<i>C. praetextum</i> Bengtsson, 1914	L: Ančia, 26 July 1957, 1 l. (2).

Table 1 continued

Family	Species	Locality, date, specimens and references
	<i>Procloeon bifidum</i> (Bengtsson, 1912) [<i>P. ornatum</i> Tshernova, 1928]	R: Nemunas: Birštonas, 19 June 1957, 1 l., Neris, Verknė, Dubysa, Vokė, Žeimena, Šešuvis, Salantas, Varduva, Šaltuona, Mituva; S: Kiršinas, Mūkė, Lapišė, Upė, Vidauja; L: Skaistis (2).
	<i>P. macronyx</i> (Kluge, Novikova, 1992)	R: Neris: Vilnius, 22–29 June 1988, 15 ♂, 32 ♀ (all reared from larvae); Nemunas: Rylišķiai, 24 June 1959 2 ♂, 4 l.; Nemunas: Kaunas, 28 June 1959, 10 ♂ (10).
	<i>P. pulchrum</i> (Eaton, 1885)	R: Neris: Vilnius, 23–29 June 1988, 13 ♂, 18 ♀, 18 June 1961, 1 ♂, 5 l., 5 July 1959, 2 ♂, 1 ♀ (10).
	<i>Pseudocentropiloides nana</i> (Bogoescu, 1951) [<i>Pseudocentropilum shadini</i> Kazlauskas, 1964]	R: Neris: Vilnius, 28–30 June 1988, 2 ♂, 4 ♀ (all reared from larvae) (10).
Caenidae	<i>Brachycercus europaeus</i> Kluge, 1991 [<i>B. palidus</i> (Tshernova, 1928)]	R: Nemunas, 25 June 1959, 1 l.; Neris: Vilnius, 19 August 1962, 1 l., 6 August 1959, 87 l. (5).
	<i>B. harrisella</i> Curtis, 1834 [<i>Eurycaenis harrisella</i> (Curtis, 1834)]	R: Dubysa, 18–19 August 1957, 2 ♂; Nemunas, Neris, Verknė, Ūla; S: Peršokšna (2). R: Babrungas above Plungė, 25 June 2003, 2 l.; Luoba: Vaičaičiai, 28 July 2004, 2 l.; Miniņa: Paplienija, 31 July 2004, 2 l.; Šešuvis: Ožnugariai, 17 August 2004, 1 l. (12).
	<i>Caenis horaria</i> (Linnaeus, 1758)	C: Ventė cape (1); R: Šaltuona: Eržvilkas, 16 August 1957, 1 ♂; L: Skaistis (2). R: Nemunas (6).
	<i>C. luctuosa</i> (Burmeister, 1839) [<i>Caenis moesta</i> Bengtsson, 1917]	R: Nemunas (6).
	<i>C. macrura</i> Stephens, 1835	C: Ventė cape (1). R: Nemunas, Neris, Verknė, Dubysa, Vokė, Ūla, Šešuvis; S: Peršokšna; L: Skaistis (2).
	<i>C. pseudorivulorum</i> Keffermuller, 1960	R: Nemunas (6).
	<i>C. rivulorum</i> Eaton 1884	R: Nemunas (6).
	<i>Cercobrachys minutus</i> (Tshernova, 1952) [<i>Brachycercus minutus</i> Tshernova, 1952]	R: Nemunas (6, 8).
Heptageniidae	<i>Ecdyonurus dispar</i> (Curtis 1834) [<i>E. fluminum</i> Pictet, 1843]	R: Dubysa, Salantas, Varduva, Mituva; S: Peršokšna, Karklė, Kiršinas, Mūkė, Tvarkantė, Lapišė, Vidauja (2). R: Nemunas: Vilkija (6). R: Vilnelė: Vilnius, 26 March 2004, 1 l.; Veiviržas: Antkoptis, 2 August 2004, 1 l.; Ežeruona: Aukštupiai, 17 August 2004, 1 l.; Alantas: Kartena, 1 August 2004, 1 l.; Žvelsa: Lapiai, 2 August 2004, 1 l.; Šunija: Lomiai, 18 August 2004, 1 l.; Šešuvis: Ožnugariai, 17 August 2004, 1 l.; S: Šventupis: Kejėnai, 26 August 2004, 1 l.; Babrūnė: Valėnai, 28 August 2004, 1 l. (12). R: Nemunas, Neris: Nemenčinė (2). R: Nemunas (6). R: Žeimena: Pabradė, 24 August 2004, 3 l. (12).
	<i>Electrogena affinis</i> (Eaton, 1883) [<i>E. affinis</i> Eaton, 1883] [<i>Heptagenia affinis</i> (Eaton, 1885)]	R: Nemunas, Neris: Nemenčinė (2). R: Nemunas (6). R: Žeimena: Pabradė, 24 August 2004, 3 l. (12).

Table 1 continued

Family	Species	Locality, date, specimens and references
	<i>Heptagenia coeruleans</i> Rostock, 1878	R: Nemunas: Birštonas, Neris: Vilnius (2).
	<i>H. flava</i> Rostock, 1878	R: Nemunas, Neris: Nemenčinė, Dubysa, Mera, Salantas, Varduva; S: Peršokšna, Ruda: Veisiejai (2). R: Babrungas above Plungė, 22 May 2003, 2 l. (12).
	<i>H. longicauda</i> (Stephens, 1835) [<i>H. flavipennis</i> Dufour, 1841]	R: Nemunas (6). Verknė: Stakliškės, 20–21 June 1957, 3 ♂, 1 ♀ (2).
	<i>H. sulphurea</i> (Müller, 1776)	R: Nemunas (6). R: Babrungas: Stonaičiai, 25 July 2004, 2 l.; S: Blendžiava: Skaudaliai, 3 September 2005, 3 l. (12).
	<i>Kageronia fuscogrisea</i> (Retzius, 1783)	R: Neris, Žeimenai: Pažeimenė, 17 May 1957, 1 ♂; S: Peršokšna (2). R: Nemunas (6).
Ephemerellidae	<i>Ephemerella notata</i> Eaton, 1887 [<i>Chitonophora notata</i> Eaton, 1887]	R: Mera, 28 May 1957, 7 ♀; S: Grūda, 28 June 1954, 10 l.; 9 June 1956, 8 ♀ (reared from larvae) (2). R: Verknė, 10 June 1959, 86 ♀ (3). R: Nemunas, Merkys, Verknė, Neris (6). R: Babrungas above Plungė, 22 May 2003, 3 l. (12).
	<i>E. mucronata</i> (Bengtsson, 1909) [<i>Chitonophora mucronata</i> Bengtsson, 1909]	R: Mera, 28 May 1957, 1 l.; S: Saria, 23 May 1956, 1 ♂ subimago, 26 February 1958, 1 l. (2). R: Nemunas (6).
	<i>Eurylophella karelica</i> Tiensuu, 1935 [<i>Eurylophella lituanica</i> Kazlauskas, 1959]	R: Ūla: Zervynos, 9 May 1956, 1 l.; Šešuvis: Varlaukis, 17 August 1957, 3 l. (2). R: Nemunas: Jurbarkas, 5 June 1965, 1 l.; Jara, 10 June 1959, 120 l., 51 imago (6).
	<i>Serratella ignita</i> (Poda, 1761) [<i>Ephemerella ignita</i> (Poda, 1761)]	R: Skirvytė mouth (1). R: Nemunas (6). R: Luoba: Vaičiai, 28 July 2004, 2 l.; Šunija: Lomia, 18 August 2004, 1 l.; Šešuvis: Ožnugariai, 17 August 2004, 1 l.; Minija: Paplienija, 31 July 2004, 2 l. (12).
	<i>S. maculocaudata</i> (Ikonov, 1961) [<i>Ephemerella mesoleuca</i> (Brauer, 1857)]	R: Verknė: Stakliškės, 27–30 June 1988, 2 ♂, 3 l.; Neris: Vilnius, 30 June 1988, 1 ♂ 1 ♀ (7, 11).
Ephemeridae	<i>Ephemerella danica</i> Müller, 1764	R: Verknė, Ūla, Mera; S: Peršokšna, Grūda (2). R: Nemunas (6). R: Minija: Paplienija, 31 July 2004, 2 l.; Luoba: Vaičiai, 28 July 2004, 2 l.; Šalpė: Šalpėnai, 3 August 2004, 4 l. (12).
	<i>E. lineata</i> Eaton, 1870	R: Neris: Vilnius, Verknė: Stakliškės; S: Peršokšna: Mazūriškės (2). R: Nemunas (6). R: Lakaja: Argidiškė, 24 August 2004, 2 l.; Veiviržas: Diegliai, 5 August 2005, 1 ♂ (12).
	<i>E. vulgata</i> Linnaeus, 1758	C: Kniupas bay (1). R: Nemunas (6). S: Aitra: Labardžiai, 16 August 2004, 5 l. (12).
Isonychiidae	<i>Isonychia ignota</i> (Walker, 1853)	R: Neris: Nemenčinė (2). R: Nemunas (6).
Leptophlebiidae	<i>Habrophlebia fusca</i> (Curtis, 1834)	S: Karklė, 17 July 1954, 2 ♂, 1 ♀, 14 August 1954, 1 ♂; Kiršinas, 4 August 1957, 1 ♂ subimago (2). R: Nemunas (6).
	<i>H. lauta</i> Eaton, 1884	S: Pilaitė, 18 June 1956; R: Neris, Verknė, Vokė (2). R: Nemunas: Druskininkai; Nemunas: Vilkija (6). S: Sausdravas: Žlibinai, 12 November 2004, 1 l. (12).

Table 1 continued

Family	Species	Locality, date, specimens and references
	<i>Leptophlebia marginata</i> (Linnaeus, 1767)	S: Peršokšna, 11 June 1956, 1 ♂; Grūda, 9 May 1956, 1 ♂ (2).
	<i>L. vespertina</i> (Linnaeus, 1758)	L: Skaistis, 6 June 1956, 1 ♂; Žalieji, 13 May 1957, 1 subimago (2). S: Sausdravas: Žlibinai, 12 November 2004, 1 l. (12).
	<i>Paraleptophlebia cincta</i> (Retzius, 1783)	R: Mera, Verknė, Šalčia; S: Peršokšna (2).
	<i>P. submarginata</i> (Stephens, 1835)	R: Verknė, Mera, Musė; S: Peršokšna, Karklė, Saria (2). R: Nemunas (6). R: Vilnelė: Vilnius, 28 March 2004, 1 l. (12).
	<i>P. wernerii</i> Ulmeri, 1920	R: Neris: Nemenčinė, 7 August 1957, 1 ♂; S: Pilaitė, 15 June 1956, 6 ♂, 1 ♀; Pilaitė, 18 June 1956, 3 ♂, 2 ♀ (2).
Neoephemeridae	<i>Neoephemera maxima</i> (Joly, 1870)	R: Verknė: Stakliškės, 20 June 1957, 4 ♂, 4 ♀ subimago; S: Grūda: Kašėtos, 7–8 June 1956, 6 ♀, 1 ♂ subimago; Grūda: Kašėtos, 12–14 June 1956, 1 ♂ subimago (2).
Oligoneuriidae	<i>Oligoneuriella keffermuelleriae</i> Sowa, 1973	R: Neris: Nemenčinė, 7 July 1957, 2 l., 7 August 1957, 1 l.; Nemunas: Druskininkai–Birštonas (2). R: Neris: Vilnius (10).
Polymitarcyidae	<i>Ephoron virgo</i> (Olivier, 1791) [<i>Polymitarcys virgo</i> (Olivier, 1791)]	R: Nemunas: Rumšiškės, Nemunas: Punia (2). R: Nemunas: the stretch Alytus–Birštonas (6).
Potamanthidae	<i>Potamanthus luteus</i> (Linnaeus, 1767)	C: Kniaupas bay (1). R: Nemunas, Neris, Verknė, Dubysa, Vokė, Žeimena, Mera, Šešuvis; S: Peršokšna (2). R: Babrungas: Stonaičiai, 25 July 2003, 3 l.; Lakaja: Argidiškė, 24 August 2004, 1 l.; Akmena: Biržų Laukas, 19 August 2004, 1 l.; Jūra: Drobūkščiai, 17 August 2004, 1 l.; Žeimena: Pabradė, 24 August 2004, 1 l. (12).
Siphonuridae	<i>Siphonurus aestivalis</i> (Eaton, 1903)	R: Žeimena: Švenčionėliai, 10 July 1955, 2 ♂, 3 ♀ (2).
	<i>S. alternatus</i> (Say, 1824). [<i>Siphonurilla linnaeanus</i> Eaton, 1871]	R: Neris: Nemenčinė; Varduva; S: Peršokšna, 15 July 1955, 2 ♂ (2). Nemunas washes (6). S: Veržuva: Ž. Veržuva, 14 May 2004, 3 l. (12).
	<i>S. armatum</i> (Eaton, 1871)	R: Nemunas: Zapyškis, 1 June 1955, 1 ♂ subimago (2).

DISCUSSION

Literature analysis showed that 60 species of mayflies have been reported for Lithuanian waters so far. This number is rather large in comparison with numbers reported from the neighbouring countries, which indicates that the mayfly fauna in Lithuania is quite well studied. The numbers of mayfly species given for

Poland and Latvia are 114 and 43 (Alain & Belfiore 2005), whereas for Finland and Sweden – 54 and 58 (Engblom 1996), respectively. A total of 92 mayfly species are known from the East European Plain (N. J. Kluge, pers. comm.).

The great majority of Lithuanian mayfly species are widespread in the neighbouring countries. However, some of them have a limited distribution range and are

rear across Europe: e. g., *Eurylophella karelica* is known only from Karelia (Russia) (Tiensuu 1935), Poland (Jażdżewska 1997), Hungary and Slovenia (Kovacs & Ambrus 1999); *Neophemera maxima* – from Hungary (Kovacs *et al.* 2003), France (Fontan *et al.* 1999), Poland (Jażdżewska 1975) and Macedonia (Ikonomov 1962); *Brachycercus europaeus* – from Hungary (Kovacs *et al.* 2003), France (Lecureuil & Chovet 2001) and Russia (Kazlauskas 1977); and *Oligoneuriella keffermuelleri* – from Hungary (Kovacs *et al.* 2003) and Poland (Kluge 1997).

Although the mayfly fauna of Lithuania is sufficiently well investigated, the presence of a few so far unrecorded species might be expected. They may include the following species reported from Latvia and Poland: Caenidae *Caenis robusta* Eaton, 1884 and *C. lactea* (Burmeister, 1839) Baetidae *Baetis tracheatus* Keffermüller & Machel, 1967, *B. liebenauae* Keffermüller, 1974, *Cloeon schoenemundi* Bengtsson, 1936, and Siphonuridae *Siphonurus lacustris* (Eaton, 1870). The absence of these species in the Lithuanian species list may have resulted due to taxonomic identification problems and inadequate surveys of stagnant water bodies such as lakes, water reservoirs and ponds. Data on mayflies living in springs is also scarce. Thus, the above mayfly species are likely to be detected in future studies.

So far as the studies of mayflies are concerned, some regions of Lithuania are better studied than others. The most extensive surveys were undertaken in the eastern and southern parts of Lithuania during 1957–1968, as

well as in the western part during 2003–2004. However, data on mayflies from the northern part of Lithuania are absent (Fig. 1).

It should be noted that comprehensive studies of mayflies on the largest Lithuanian rivers Nemunas and Neris and their tributaries were carried out by A. Kazlauskas 40 years ago, therefore since then the extinction of some potamabiont mayflies species may not be excluded. Decreases of mayfly species in the largest rivers of Europe due to their pollution have been reported recently (Melzacher *et al.* 1998).

In conclusion, the current survey of literature showed that a total of 58 mayfly species representing 13 families have been recorded in Lithuania and reported in 17 publications. The reports on six other species were considered to be incorrect or doubtful. The list of mayflies was supplemented with two new to the Lithuanian fauna species which were not reported in literature until now. Consequently, this list contains 60 mayfly species.

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REFERENCES

- Alain, T. and Belfiore, C. (eds) 2005. *Ephemeroptera. Fauna Europaea* version 1.2, <http://www.faunaeur.org>.
- Bauernfeind, E. and Moog, O. 2000. Mayflies (Insecta: Ephemeroptera) and assessment of ecological integrity: a methodological approach. *Hydrobiologia* 422/423: 71–83.
- Bubinas, A. and Jagminienė, I. 2001. Bioindication of ecotoxicity according to community structure of macrozoobenthic fauna. *Acta Zoologica Lituanica* 11 (1): 90–96.
- Bubinas, A. and Jagminienė, I. 2002. Bioindication of the Neris River based on the structure of hydrobiocenoses. *Acta Zoologica Lituanica* 12 (1): 42–46.
- Englom, E. 1996. Ephemeroptera, Mayflies. In: A. Nielsen (ed.) *Aquatic insects of North Europe – A taxonomic Handbook*, pp. 13–53.
- Fontan, M., Brulin, N. and Masselot, G. 1999. Rediscovery of *Neophemera maxima* for the Ephemeroptera fauna of France (Ephemeroptera: Neophemeridae). *Ephemera* 1 (1): 31–34. [Fontan, M., Brulin, N., Masselot, G.

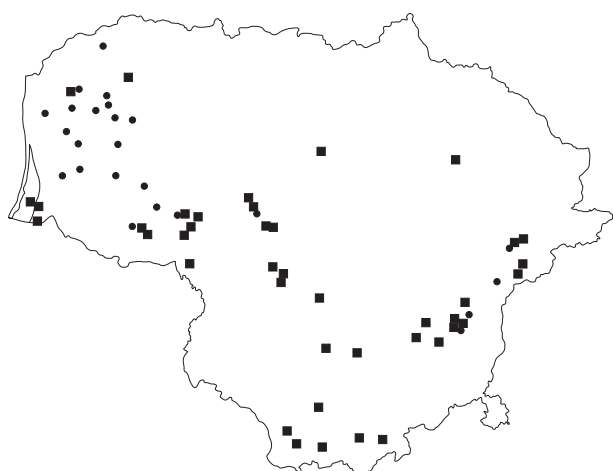


Figure 1. Localities of mayfly studies in Lithuania. Squares and circles indicate samplings during 1957–1997 and 2003–2004, respectively.

1999. Redécouverte de *Neophemera maxima* (Joly, 1870) pour la France (Ephemeroptera: Neophemeridae) *Ephemera* 1 (1): 31–34.]
- Gasiūnas, I. 1959. The zoomacrobenthos of the Curonian Lagoon. In: *The Curonian lagoon*, pp. 191–293. [Гасюнас, И. 1959. Кормовой зообентос залива Куршю марес. В: *Куршю марес*, сс. 191–293.]
- Jażdżewska, T. 1975. *Neophemera maxima* (Joly, 1870) (Ephemeroptera: Neophemeridae) in Poland. *Polskie Pismo Entomologiczne* 45: 227–238.
- Jażdżewska, T. 1997. Mayflies (Ephemeroptera) of the sandy bottom of the River Grabia (Central Poland). In: P. Landolt and M. Sartori (eds) *Ephemeroptera and Plecoptera: Biology-Ecology-Systematics*, pp. 157–166. CH-Fribourg, SA: Maron Tinguely & Lachat.
- Ikonomov, P. 1962. Eintagsfliegen (Ephemeroptera) Jugoslaviens *Oreianthus macedonicus* (Ulmer) = (*Rhoenanthus macedonicus* Ulm) *Fragmenta Balcanica. Musei Macedonici Scientiarum Naturalium* 4: 81–91.
- Kazlauskas, R. 1959. Material about the mayflies (Ephemeroptera) in the Lithuanian SSR with description of new species *Eurylophella lithuanica* Kazlauskas sp. n. and imago *Neophemera maxima* (Joly). *Biology, Geography and Geology* 6: 157–174. [Казлаускас, Р. 1959. Материалы по фауне подёнок (Ephemeroptera) Литовской ССР с описанием нового вида *Eurylophella lithuanica* Kazlauskas sp. n. и имаго *Neophemera maxima* (Joly). *Биология, География, Геология* 6: 157–174.]
- Kazlauskas, R. 1962. The new date on mayflies (Ephemeroptera) of Baltic States. *Hydrobiological studies* III: 147–149. [Казлаускас, Р. 1962. Новые данные по фауне поденок (Ephemeroptera) Прибалтики. *Гидробиологические исследования* III: 147–149.]
- Kazlauskas, R. S. 1964. The date on mayflies of the River Oka. *Scientific works of Zoological Institute of the Academy of Sciences of the USSR* 32: 164–176. [Казлаускас, Р. 1964. Материалы к познанию поденок реки Ока. *Труды Зоологического Института Академии Наук СССР* 32: 164–176.]
- Kazlauskas, R. 1965. *Brachycercus pallidus* Tshern and *Baetopus wartensis* Keff. (Ephemeroptera) in the rivers of the Lithuanian SSR. *Scientific works of the Lithuanian SSR. Biology* 5: 201–204. [Казлаускас, Р. 1965. *Brachycercus pallidus* Tshern и *Baetopus wartensis* Keff. (Ephemeroptera) в реках Литовской ССР. *Научные труды Литовской ССР. Биология* 5: 201–204.]
- Kazlauskas, R. 1968. The mayflies of Nemunas River. *The scientific works of higher education in Lithuania, Biology* VII: 197–206. [Kazlauskas, R. 1968. Nemuno lašalai. *Lietuvos TSRS aukštųjų mokyklų mokslo darbai. Biologija* VII: 197–206.]
- Kazlauskas, R. 1976. The features of habitat of mayflies (Ephemeroptera). In: *Species and its productivity in the areal*: 63–64. [Казлаускас, Р. 1976. Особенности ареалов речных подёнок (Ephemeroptera). *Вид и его продуктивность в ареале*: 63–64.]
- Kazlauskas, R. 1977. Ephemeroptera. In: *Key to freshwater of the European USSR*, pp. 288–303. [Казлаускас, Р. 1977. Подёнки. В: *Определитель пресноводных беспозвоночных Европейской части СССР*, сс. 288–303.]
- Kluge, N. J. 1997. Ephemeroptera. In: *Key to freshwater invertebrates of Russia and adjacent lands*, pp. 177–220. [Клюге, Н. Ю. 1997. Подёнки. В: *Определитель пресноводных беспозвоночных России и сопредельных стран*, сс. 177–220.]
- Kluge, N. J. and Novikova, E. A. 1992. Revision of Palearctic genera and subgenera of Mayflies in the Subfamily Cloeoninae (Ephemeroptera, Baetidae) with description of new species from the USSR. *Entomological Review* 71 (9): 29–54.
- Kovacs, T. and Ambrus, A. 1999. *Eurylophella karelica* Tiensuu, 1935 in the Carpathian Basin (Ephemeroptera: Ephemerellidae). *Folia Historica Naturalia Musei Matraensis* 23: 153–156.
- Kovacs, T., Ambrus, A. and Juhasz, P. 2003. Data to the Hungarian mayfly (Ephemeroptera) fauna arising from collecting of larvae II. *Folia Historica Naturalia Musei Matraensis* 27: 59–72.
- Lecureuil, J. Y. and Chovet, M. 2001. Additional date to the France mayfly: *Brachycercus europaeus* Kluge, 1991 and *Cercobrachys minutus* (Tshernova, 1952) (Ephemeroptera, Caenidae, Brachycercinae). *Ephemera* 3 (2): 83–90. [Lecureuil, J. Y. and Chovet, M. 2001. Additions à la Faune des Ephéméroptères de France: *Brachycercus europaeus* Kluge, 1991 et *Cercobrachys minutus* (Tshernova, 1952) (Ephemeroptera, Caenidae, Brachycercinae). *Ephemera* 3 (2): 83–90.]
- Malzacher, P., Jacob, U., Haybach, A. and Reusch, H. 1998. Red list of mayflies (Ephemeroptera). In: *Red list of endangered species in Germany* 55: 264–267. [Malzacher, P., Jacob, U., Haybach, A. and Reusch, H. 1998. Rote Liste der Eintagsfliegen (Ephemeroptera). In: *Rote list gefährdeter Tiere in Deutschland* 55: 264–267.]
- Pliūraitė, V. 2001a. Seasonal changes of the abundance, biomass, species composition of macrozoobenthos in the River Merkys and Sventoji. *Ekologija* 4: 16–29. [Pliūraitė, V. 2001a. Makrozoobentoso gausumo, biomasės ir rūšinės sudėties sezoninė kaita Merkio ir

Šventosios upėse. *Ekologija* 4: 16–29.]

Pliūraitė, V. 2001b. The seasonal change of macrobenthos in Merkys River in 1998. *Acta Zoologica Lituanica* 11 (1): 39–52.

Pliūraitė, V. and Kesminas, V. 2004. Species composition of macroinvertebrates in medium-sized Lithuanian Rivers. *Acta Zoologica Lituanica* 14 (3): 10–25.

Tiensuu, L. 1935. On the Ephemeroptera-fauna of Laatokan Karijala (Karelia Ladogensis). *Annales entomologici fennici* 1: 3–23.

Virbickas, J. and Pliūraitė, V. 2002. The species composition of macrozoobenthos in small Lithuanian Rivers. *Acta Zoologica Lituanica* 12 (3): 254–264.

Ulmer, G., Strandv, E., Horn, W. and Uber, W. 1917. Horn litauische entomologische Kriegsausbeute 1916. *Entomologischen Mitteilungen* 6 (10/12): 290–293.

LIETUVOS LAŠALŲ (INSECTA: EPHEMEROPTERA) RŪŠIŲ SĄRAŠAS

T. Ruginis

SANTRAUKA

Pagal literatūros duomenis nustatyta, kad Lietuvoje buvo rastos 58 lašalų rūšys. Šešių kitų rūšių paminėjimai yra klaidingi. Lašalų sąrašas papildytas dviem naujomis rūšimis – *Baetis buceratus* Eaton, 1870 ir *B. calcaratus* Keffermuler, 1972, kurios iki šiol neskelbtos. Taigi viso Lietuvoje rasta 60 lašalų rūšių iš 13 šeimų.

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Annex 1. Information on localities of mayfly studies.

Water body	Basin	Locality	Coordinates	District
1	2	3	4	5
Rivers				
Akmena	Jūra	Biržų Laukas	55°27'N, 22°12'E	Šilalė
Alantas	Minija	Kartena	55°55'N, 21°30'E	Kretinga
Babrungas	Minija	Plungė	55°54'N, 21°53'E	Plungė
		Stonaičiai	55°53'N, 21°46'E	Plungė
Blendžiava	Minija	Skaudaliai	56°00'N, 21°32'E	Kretinga
Dubysa	Nemunas	Maironiai–Ariogala	No exact locality recorded	Kelmė–Raseiniai
Ežeruona	Jūra	Aukštupiai	55°16'N, 22°10'E	Tauragė
Jūra	Nemunas	Drobūkščiai	55°30'N, 22°02'E	Tauragė
Kiršinas	Nevėžis	No exact locality recorded		Radviliskis–Panevėžys
Luoba	Bartuva	Vaičiai	56°14'N, 21°54'E	Skuodas
Mera	Žeimena	No exact locality recorded		Švenčionys
Merkys	Nemunas	No exact locality recorded		Šalčininkai–Varėna
Minija	Nemunas	Paplienija	55°51'N, 22°10'E	Telšiai
Mituva	Nemunas	Žindaičiai	55°10'N, 22°42'E	Jurbarkas
Nemunas		Druskininkai	55°16'N, 22°10'E	Druskininkai
		Ryliškiai	55°13'N, 24°01'E	Alytus
		Punia	54°31'N, 24°06'E	Alytus
		Birštonas	55°13'N, 24°36'E	Alytus
		Rumšiškės	54°52'N, 24°12'E	Kaunas
		Kaunas	54°52'N, 23°55'E	Kaunas
		Zapyškis	54°56'N, 23°40'E	Kaunas
		Vilkija	54°03'N, 23°35'E	Kaunas
		Jurbarkas	54°05'N, 22°45'E	Jurbarkas
		Skirvytė	55°17'N, 21°20'E	Šilutė
Neris	Nemunas	Nemenčinė	54°50'N, 25°29'E	Vilnius
		Vilnius	54°45'N, 25°20'E	Vilnius
		Rykantai	54°44'N, 25°00'E	Trakai
Salantas	Minija	No exact locality recorded		Kretinga
Šalpė	Veiviržas	Šalpėnai	55°33'N, 21°37'E	Klaipėda
Šaltuona	Jūra	Eržvilkas	55°15'N, 22°42'E	Nemunas
Šešuvis	Jūra	Varlaukis	55°19'N, 22°41'E	Tauragė
		Ožnugariai	55°19'N, 22°37'E	Tauragė
		Tauragė	55°13'N, 22°15'E	Tauragė
Šunija	Jūra	Lomia	55°23'N, 22°25'E	Tauragė
Šventoji	Neris	Svėdasai	55°39'N, 25°18'E	Anykščiai
Ūla	Merkys	Zervynos	54°07'N, 24°30'E	Varėna
Varduva	Venta	Žemaičių Kalvarija	56°06'N, 22°01'E	Plungė
Veiviržas	Minija	Antkoptis	55°43'N, 21°35'E	Klaipėda
		Diegliai	55°33'N, 21°27'E	Šilutė
Verknė	Nemunas	Stakliškės	54°34'N, 24°20'E	Prienai
Vokė	Neris	No exact locality recorded		Vilnius
Žeimena	Neris	Pabradė	54°59'N, 25°47'E	Švenčionys
Žvelsa	Minija	Lapiai	55°46'N, 21°29'E	Klaipėda
Streams				
Aitra	Jūra	Labardžiai	55°42'N, 22°01'E	Plungė
Babrūnė	Akmena–Danė	Valėnai	55°51'N, 21°15'E	Kretinga

Annex 1 continued

Water body	Basin	Locality	Coordinates	District
Grūda	Merkys	Kašėtos	54°07'N, 24°21'E	Varėna
Karklė	Nemunas	No exact locality recorded		Kaunas
Kulautuva	Nemunas	No exact locality recorded		Kaunas
Lakaja	Žeimena	Argidiškė	55°03'N, 25°50'E	Švenčionys
Lapišė	Dubysa	No exact locality recorded		Raseiniai
Mūkė	Dubysa	No exact locality recorded		Raseiniai
Peršokšna	Žeimena	Mazūriškės	55°12'N, 25°49'E	Švenčionys
Pilaitė	Neris	No exact locality recorded		Vilnius
Tvarkantė	Dubysa	No exact locality recorded		Raseiniai
Upė	Šešuvis	No exact locality recorded		Jurbarkas
Ruda	Baltoji Ančia	Veisiejai	55°13'N, 23°41'E	Lazdijai
Sausdravas	Minija	Žlibinai	55°53'N, 22°00'E	Plungė
Saria	Žeimena	No exact locality recorded		Švenčionys
Šventupis	Dubysa	Kejėnai	55°18'N, 23°15'E	Raseiniai
Veržuva	Neris	Ž. Veržuva	54°45'N, 25°23'E	Vilnius
Vidauja	Mituva	Vilniškiai	55°13'N, 22°42'E	Jurbarkas
Lakes				
Ančia	Veisiejai		54°05'N, 23°41'E	Lazdijai
Skaistis	Žydiškės		54°40'N, 24°59'E	Trakai
Lagoon				
Curonian		Ventė cape	55°20'N, 21°12'E	Šilutė
Curonian		Kniaupas bay	55°21'N, 21°14'E	Šilutė

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