

## CONTRIBUTIONS TO A REVISED SPECIES CONSPECT OF THE *EPHEMEROPTERA* FAUNA FROM ROMANIA (mayfliesyst)

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### INTRODUCTION

In the volume „Lista faunistică a României (specii terestre și de apă dulce) [List of Romanian fauna (terrestrial and freshwater species)], editor-in-chief Anna Oana Moldovan from "Emil Racovita" Institute of Speleology, Cluj-Napoca, Milca Petrovici

wrote the chapter Order Ephemeroptera (2007, pp.235-236) and mentioned 108 species in the list of Ephemeroptera from our country, indicating the authors of their citation. It is the first time since the publication of a fauna volume (Bogoescu, 1958) that such a list has been made public. Here is this list followed by our observations.

### Order EPHEMEROPTERA Superfamily BAETISCOIDEA Family PROSOPISTOMATIDAE

Genus	Species	Author, year
1. <i>Prosovistoma</i>	<i>pennigerum</i>	Mueller, 1785

### Superfamily BAETOIDEA Family AMETROPODIDAE

2. <i>Ametropus</i>	<i>fragilis</i>	Albarda, 1878
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### Family BAETIDAE

3. <i>Acentrella</i>	<i>hyaloptera</i>	Bogoescu, 1951
4. <i>Acentrella</i>	<i>inexpectata</i>	Tschenova, 1928
5. <i>Acentrella</i>	<i>sinaica</i>	Bogoescu, 1931
6. <i>Baetis</i>	<i>alpinus</i>	Pictet, 1843
7. <i>Baetis</i>	<i>buceratus</i>	Eaton, 1870
8. <i>Baetis</i>	<i>fuscatus</i>	Linnaeus, 1761
9. <i>Baetis</i>	<i>gracilis</i>	Bogoescu and Tabacaru, 1957
10. <i>Baetis</i>	<i>lutheri</i>	Eaton, 1885
11. <i>Baetis</i>	<i>melanonyx</i>	Bogoescu, 1933
12. <i>Baetis</i>	<i>muticus</i>	Bürmeister, 1839
13. <i>Baetis</i>	<i>niger</i>	Linnaeus, 1761
14. <i>Baetis</i>	<i>rhodani</i>	Pictet, 1843
15. <i>Baetis</i>	<i>scambus</i>	Eaton, 1870
16. <i>Baetis</i>	<i>tenax</i>	Eaton, 1870
17. <i>Baetis</i>	<i>tricolor</i>	Tschenova, 1828
18. <i>Baetis</i>	<i>vernus</i>	Curtis, 1864
19. <i>Centroptilum</i>	<i>luteolum</i>	Müller, 1775
20. <i>Cloeon</i>	<i>dipterum</i>	Linné, 1761
21. <i>Cloeon</i>	<i>inscriptum</i>	Bengtsson, 1914
22. <i>Cloeon</i>	<i>rufulum</i>	Müller, 1776
23. <i>Cloeon</i>	<i>simile</i>	Eaton, 1870
24. <i>Pseudocentroptilum</i>	<i>nana</i>	Bogoescu, 1951
25. <i>Pseudocentroptilum</i>	<i>romanica</i>	Bogoescu, 1949
26. <i>Procloeon</i>	<i>bifidum</i>	Bengtsson, 1912
27. <i>Procloeon</i>	<i>pennulatum</i>	Eaton, 1870
28. <i>Procloeon</i>	<i>pulchrum</i>	Eaton, 1885
29. <i>Procloeon</i>	<i>unguiculatum</i>	Tschernova, 1941

	<b>Family SIPHLONURIDAE</b>	
30. <i>Ameletus</i>	<i>inopinatus</i>	Eaton, 1887
31. <i>Isonychia</i>	<i>ignata</i>	Walker, 1853
32. <i>Siphonurus</i>	<i>aestivalis</i>	Eaton, 1903
33. <i>Siphonurus</i>	<i>alternatus</i>	Say, 1824
34. <i>Siphonurus</i>	<i>armatus</i>	Eaton, 1870
35. <i>Siphonurus</i>	<i>lacustris</i>	Eaton, 1870
	<b>Superfamily CAENOIDEA</b>	
	<b>Family CAENIDAE</b>	
36. <i>Brachycercus</i>	<i>harrisella</i>	Curtis, 1834
37. <i>Caenis</i>	<i>horaria</i>	Linnaeus, 1758
38. <i>Caenis</i>	<i>lactea</i>	Bürmeister, 1839
39. <i>Caenis</i>	<i>luctuosa</i>	Bürmeister, 1839
40. <i>Caenis</i>	<i>macrura</i>	Stephens, 1835
41. <i>Caenis</i>	<i>pusilla</i>	Navas, 1913
42. <i>Caenis</i>	<i>rivulorum</i>	Eaton, 1884
43. <i>Caenis</i>	<i>robusta</i>	Eaton, 1884
	<b>Superfamily EPHEMERELLOIDEA</b>	
	<b>Family EPHEMERELLIDAE</b>	
44. <i>Ephemerella</i>	<i>mucronata</i>	Bengtsson, 1909
45. <i>Ephemerella</i>	<i>notata</i>	Eaton, 1887
46. <i>Serratella</i>	<i>ignita</i>	Poda, 1761
47. <i>Serratella</i>	<i>mesoleuca</i>	Brauer, 1857
48. <i>Torleya</i>	<i>major</i>	Klapalek, 1905
	<b>Family BEHNINGIIDAE</b>	
49. <i>Behningia</i>	<i>lestagei</i>	Motaş, 1936
	<b>Family EPHEMERIDAE</b>	
50. <i>Ephemerella</i>	<i>danica</i>	Müller, 1764
51. <i>Ephemerella</i>	<i>glaucops</i>	Pictet, 1843
52. <i>Ephemerella</i>	<i>lineata</i>	Eaton, 1870
53. <i>Ephemerella</i>	<i>vulgata</i>	Linnaeus, 1758
	<b>Family PALINGENIIDAE</b>	
54. <i>Palingenia</i>	<i>longicauda</i>	Oliver, 1791
	<b>Family POLYMITARCYIIDAE</b>	
55. <i>Ephoron</i>	<i>virgo</i>	Oliver, 1791
	<b>Family POTAMANTHIDAE</b>	
56. <i>Potamanthus</i>	<i>luteus</i>	Linnaeus, 1767
	<b>Superfamily HEPAGENIOIDEA</b>	
	<b>Family HEPTAGENIIDAE</b>	
57. <i>Ecdyonurus</i>	<i>aurantiacus</i>	Burmeister, 1839
58. <i>Ecdyonurus</i>	<i>austriacus</i>	Kimmins, 1958
59. <i>Ecdyonurus</i>	<i>carpathicus</i>	Sowa, 1973
60. <i>Ecdyonurus</i>	<i>dispar</i>	Curtis, 1834
61. <i>Ecdyonurus</i>	<i>forcipula</i>	Pictet, 1845
62. <i>Ecdyonurus</i>	<i>fuscogriseus</i>	Retzius, 1783
63. <i>Ecdyonurus</i>	<i>helveticus</i>	Eaton, 1870
64. <i>Ecdyonurus</i>	<i>insignis</i>	Eaton, 1870
65. <i>Ecdyonurus</i>	<i>lateralis</i>	Curtis, 1834
66. <i>Ecdyonurus</i>	<i>macani</i>	Thomas-Sowa, 1970
67. <i>Ecdyonurus</i>	<i>picteti</i>	Meyer-Dür, 1864
68. <i>Ecdyonurus</i>	<i>starmachi</i>	Sowa, 1971
69. <i>Ecdyonurus</i>	<i>subalpinus</i>	Klapalek, 1907
70. <i>Ecdyonurus</i>	<i>submontanus</i>	Landa, 1969
71. <i>Ecdyonurus</i>	<i>torrentis</i>	Kimmins, 1942
72. <i>Ecdyonurus</i>	<i>venosus</i>	Fabricius 1775
73. <i>Ecdyonurus</i>	<i>zelleri</i>	Eaton, 1885
74. <i>Electrogena</i>	<i>affinis</i>	Eaton, 1883

75. <i>Electrogena</i>	<i>lateralis</i>	Curtis, 1834
76. <i>Electrogena</i>	<i>quadrilineata</i>	Landa, 1969
77. <i>Electrogene</i>	<i>ujhelyii</i>	Sowa, 1981
78. <i>Epeorus</i>	<i>alpicola</i>	Eaton, 1871
79. <i>Epeorus</i>	<i>sylvicola</i>	Pictet, 1885
80. <i>Epeorus</i>	<i>torrentium</i>	Eaton, 1881
81. <i>Heptagenia</i>	<i>coerulans</i>	Rostock, 1877
82. <i>Heptagenia</i>	<i>flava</i>	Rostock, 1887
83. <i>Heptagenia</i>	<i>flavipennis</i>	Dufour, 1841
84. <i>Heptagenia</i>	<i>longicauda</i>	Stephens, 1835
85. <i>Heptagenia</i>	<i>sulphurea</i>	Müller, 1776
86. <i>Kageronia</i>	<i>fuscogrisea</i>	Retzius, 1783
87. <i>Rhithrogena</i>	<i>alpestris</i>	Eaton, 1885
88. <i>Rhithrogena</i>	<i>aurantiaca</i>	Burmeister, 1839
89. <i>Rhithrogena</i>	<i>carpatoalpina</i>	Koroaska, Oedrovaska, Satai & Weidreebaumer, 1987
90. <i>Rhithrogena</i>	<i>germanica</i>	Eaton, 1885
91. <i>Rhithrogena</i>	<i>hybrida</i>	Eaton, 1885
92. <i>Rhithrogena</i>	<i>iridina</i>	Kolenati, 1859
93. <i>Rhithrogena</i>	<i>nivata</i>	Eaton, 1871
94. <i>Rhithrogena</i>	<i>savoienis</i>	Alba-Tercedor & Sowa, 1987
95. <i>Rhithrogena</i>	<i>semicolorata</i>	Curtis, 1834
96. <i>Rhithrogena</i>	<i>sowai</i>	Puthz, 1972
<b>Family OLIGONEURIIDAE</b>		
97. <i>Oligoneuriella</i>	<i>pallida</i>	Hagen, 1855
98. <i>Oligoneuriella</i>	<i>rhenana</i>	Imhoff, 1852

#### Superfamily LEPTOPHLEBIOIDEA

##### Family LEPTOPHLEBIIDAE

99. <i>Choropteres</i>	<i>picteti</i>	Eaton, 1871
100. <i>Habroleptoides</i>	<i>carpatica</i>	Bogoescu, 1930
101. <i>Habroleptoides</i>	<i>modesta</i>	Hagen, 1864
102. <i>Habrophlebia</i>	<i>fusca</i>	Curtis 1834
103. <i>Habrophlebia</i>	<i>lauta</i>	Eaton, 1884
104. <i>Leptophlebia</i>	<i>marginata</i>	Linnaeus, 1767
105. <i>Leptophlebia</i>	<i>vespertina</i>	Linnaeus, 1758
106. <i>Paraleptophlebia</i>	<i>cincta</i>	Retzius, 1783
107. <i>Paraleptophlebia</i>	<i>submarginata</i>	Stephens, 1835
108. <i>Paraleptophlebia</i>	<i>wernerii</i>	Ulmer, 1920

## MATERIALS AND METHODS

The research was conducted mainly on larvae, during the years 2003-2011. The larvae collection was made traditionally, by net or by hand. For benthic larvae, the hoop net was used. The larvae were subsequently fixed and preserved in alcohol 75%, in glass tubes or jars. To determine the species, dissections were performed under binocular magnifying glass and there were taken into account, in addition to color and conformation of the body, feet and tracheo-bronchia, the elements of the antenna, the mouth parts, legs, the tracheo-gills, on the surface and edge of the sternites. For systematic classification, we used the determination key proposed by I. Tabacaru, 2009.

## RESULTS AND DISCUSSIONS

Our observations to this list are:

- No. 6 and No.7. – *Baetis buceratus* sensu Bogoescu was determined by Kimmins as *Baetis carpatica* Morton, 1910, but *Baetis carpatica* was made synonymic by I. Müller-Liebenau (1969) with *Baetis alpinus* Pictet, 1843.
- No. 10. - Eaton did not describe the species *Baetis lutheri*, her author is Müller-Liebenau, 1967.
- No. 11. – Bogoescu did not describe the species *Baetis melanonyx*. This species was described by Pictet under the name of *Cloeo melanonyx*. So the author of the *Baetis melanonyx* is Pictet, 1843-1845.

- No. 12. – Burmeister did not describe the species *Baetis muticus*. This species was described by Linnaeus under the name of *Ephemera mutica*, so the author of the species *Baetis muticus* is Linnaeus, 1758.
- No. 16. and No.18 - I. Müller-Liebenau (1969) made *Baetis tenax* Eaton, 1870 synonymous with *Baetis vernus* Curtis, 1864, so the first name must disappear from the list.
- No. 22. – *Cloeon rufulum* Müller, 1776 is currently considered synonymous with *Cloeon dipterum* (Linnaeus, 1761), synonymy established by Sowa (1975), so the name *Cloeon rufulum* must be taken out of the list.
- No. 30. – At present, the species *Ameletus inopinatus* is not included in Family Siphonuridae, but in Family Ameletidae McCafferty, 1991.
- No. 31. – At present, the species *Isonichia ignota* is not considered as belonging to Family Siphonuridae but to Family Isonichiidae by Burks, 1953.
- No.49. – The species *Behningia lestagei* is no longer in our country, being endemic for the Nistru river.
- No. 57. and No. 88. – The same species is listed twice, once as *Ecdyonurus aurantiacus* and the second time as *Rhithrogena aurantiaca*. Having the same author and date, Burmeister 1839, both terms refer to what was also described as *Baetis aurantiaca* by Burmeister, 1839. In the opinion of Soldan & Landa (1958) what Bogoescu determined as *Rhithrogena aurantiaca* partly belongs to *Rhithrogena beskidensis* and partly to *Rhithrogena savoienensis*.
- No. 62. and No. 86. – The same species is listed twice because the species *Ecdyonurus fuscogriseus* was transferred to Genus *Kageronia* Matsumura, 1931.
- No. 65. and No. 75. – The same species is listed twice because the species *Ecdyonurus lateralis* has become the Genus *Electrogena* Zurerra & Tomka, 1985.
- - No. 83. Currently *Heptagenia flavipennis* Dufour, 1841 is considered synonymous with *Heptagenia longicauda* (Stephens, 1835); synonymy established by Kimmins in 1942. So the name *Heptagenia flavipennis* must be excluded from the list.
- No. 100. - The species described by Crasnaru and Bogoescu in 1930 under the name *Habroleptoides carpatica* was made synonymous with *Habroleptoides modesta* (Hagen, 1864) by Puthz (in Illies, 1978); Sartori and Jacob (1968) state that the criteria used by the authors to diagnose the species *H. carpatica* seem to enter the intraspecific variability of the species called *Habroleptoides confusa* Sartori & Jacob, 1968.
- No. 101. - Sartori & Jacob (1968) showed that the species *Habroleptoides modesta* (Hagen, 1864) was described in Corsica and seems to be endemic to this island. The mainland species for which Schoenemund and other authors (including Bogoescu) uses this name is actually a species called *H. confusa*. So *Habroleptoides modesta* (Hagen, 1864) must be eliminated from the list and replaced by *Habroleptoides confusa* Sartori & Jacob, 1986.
- No.4. *Acentrella inexpectata*, No. 33. *Siphonurus alternatus*, No. 39. *Caenis luctuosa*, No.42. *Caenis rivulorum*, No. 47. *Serratella mesoleuca*, No.59. *Ecdyonurus carpaticus*, No. 60. *Ecdyonurus dispar*, No.70. *Ecdyonurus submontanus*, No. 76. *Electrogena quadrilineata*, No.80. *Epeorus torrentium*, No. 84. *Heptagenia longicauda*, No. 91. *Rhithrogena hybrida*, No. 92. *Rhithrogena iridida*, No. 96. *Rhithrogena sowai* and No. 106. *Paraleptophlebia cincta*, are species mentioned by Petrovici apud Gâldean 1989, in his unpublished PhD thesis. These species have been first published in this list but without the locality where they were found.
- No.66. *Ecdyonurus macani*, No.67. *Ecdyonurus picteti*, No. 68. *Ecdyonurus starmachi*, No. 73. *Ecdyonurus zelleri*, No. 74. *Electrogena affinis*, No.77. *Electrogena ujhelyii* No.89. *Rhithrogena carpatoalpina*, No.93. *Rhithrogena nivata* species are mentioned by Milca Petrovici, apud her unpublished PhD thesis. These species appear published in this list for the first time without the locality where they were found.

Given the current results in *Ephemeroptera* systematics and the numerous reviews and synonymies that were established, we propose below a new conspect of this order of insects in our country.

## ORDER EPHEMEROPTERA

### Division Posteritorna Kluge & Studemann & Landolt & Gonser, 1995

Syn. : Subordinul **Carapacea** McCafferty, 1997

Superfamily **Prosopistomatoidea** Edmunds & Traver, 1954

Family **Prosopistomatidae** Lameere, 1917

(1 species in Europe and in Romania)

Genus **Prosopistoma** Latreille, 1833

(Typus : *Prosopistoma variegatum* Latreille, 1833- design Eaton, 1884)

Syn.: *Binoculus* Demoulin, 1954

1. *Prosopistoma pinnigerum* (Müller, 1785)  
Syn.: *Limulus pennigerum* Müller, 1785  
*Binoculus foliaceus* Fourcroy, 1785  
*Prosopistoma foliaceum* (Fourcroy, 1785)

**Division Anteritorna Kluge, 1993**  
**Suborder Furcatergalia Kluge, 1989**  
Infraorder **Scaphodonta** McCafferty, 1998  
Superfamily **Ephemeroidea** Leach, 1815

Family **Ephemeridae** Latreille, 1810  
(7 species in Europe of which 4 in Romania)

**Genus *Ephemera*** Linnaeus, 1757  
(Typus: *Ephemera vulgata* Linnaeus, 1758 – design. Latreille, 1810)

2. *Ephemera danica* Müller, 1764  
3. *Ephemera glaucops* Pictet, 1843-45  
4. *Ephemera lineata* Eaton, 1870  
5. *Ephemera vulgata* Linnaeus, 1758

Family **Palingeniidae** Albarda, 1888  
(3 species in Europe of which 1 in Romania)

Genus ***Palingenia*** Burmeister, 1839  
(Typus: *Ephemera longicauda* Olivier, 1791 - design. Hagen in Walsh, 1863)

6. *Palingenia longicauda* (Olivier, 1791)  
Family **Polymitarciidae** Banks, 1900  
(2 species in Europe, one in Romania)

**Genus *Ephoron*** Williamson, 1802  
(Typus: *Ephoron leucon* Williamson, 1802 – monotypy)  
Syn.: *Polymitarcys* Eaton, 1860

7. *Ephoron virgo* (Olivier, 1791)

Superfamily **Potamantoidea**  
Family **Potamantidae** Albarda, 1888  
(In Europe one species is present and one is in Romania)  
Genus ***Potamanthus*** Pictet, 1843-45  
(Typus: *Ephemera lutea* Linnaeus, 1767 – design. Eaton, 1868)

8. *Potamanthus luteus* (Linnaeus, 1767)

Infraorder **Lanceolata** McCafferty, 1991  
Superfamily **Leptophlebioidea** Banks, 1900  
Family **Leptophlebiidae** Banks, 1900  
(In Europe, 38 species and in Romania only 10)  
Genus ***Leptophlebia*** Westwood, 1840  
(Typus: *Ephemera vespertina* Linnaeus, 1758 - monotypy)

9. *Leptophlebia marginata* (Linnaeus, 1767)  
10. *Leptophlebia vespertina* (Linnaeus, 1758)

**Genus *Habrophlebia*** Eaton, 1881  
(Typus: *Ephemera fusca* Curtis, 1834 – design. orig.)

11. *Habrophlebia fusca* (Curtis, 1834)  
12. *Habrophlebia lauta* Eaton, 1884

**Genus *Habroleptoidea*** Schoenemund, 1929  
(Typus: *Pothamanthus modestus* Hagen, 1864 – monotypy)

13. *Habroleptoidea confusa* Sartori & Jacob, 1986  
Syn.: *Habroleptoidea modesta* : Schoenemund, 1929 et auct. nec Hagen, 1864)

14. *Habroleptoidea carpatica* Bogoescu et Crasnaru, 1930

**Genus *Paraleptophlebia*** Lestage, 1917  
(Typus: *Ephemerella cincta* Rezius 1783 design Lestage 1924)

- *Paraleptophlebia cincta* (Retzius, 1783) – species cited by Petrovici apud Gâldean, 1989, unpublished thesis

15. *Paraleptophlebia submarginata* (Stephens, 1835)

16. *Paraleptophlebia wernerii* (Ulmer, 1920)

**Genus *Choroerpes*** Eaton, 1881  
(Typus: *Choroerpes lusitanica* Eaton. 1881- design.orig.)

17. *Choroerpes picteti* (Eaton, 1871)

Infraorder **Pannota** McCafferty & Edmunds, 1979

Superfamily **Caenoidea** Spith, 1933  
Family **Caenidae** Newman, 1853  
(18 species in Europe, 7 in Romania)

Genus ***Caenis*** Stephens, 1835  
(Typus: *Caenis macrura* Stephens, 1835 - design. Westwood, 1840)  
Syn. : *Ordella* Campion, 1923 – typus *Caenis macrura* Stephens, 1835)

18. *Caenis horaria* (Linnaeus, 1758)

19. *Caenis macrura* Stephens, 1835

20. *Caenis lactea* (Burmeister, 1839)

21. *Caenis robusta* Eaton, 1884

22. *Caenis pusilla* Navas, 1913

- *Caenis luctuosa* (Burmeister, 1839)

syn. : *Caenis moesta* Bengtsson, 1917

Species cited by Petrovici apud Gâldean, 1989 – unpublished thesis

- *Caenis rivulorum* Eaton, 1884

Species cited by Petrovici apud Gâldean, 1989 – unpublished thesis.

**Genus *Brachycercus*** Curtis, 1834  
(Typus : *Brachycercus harrisella* Curtis, 1834 - design. Lestages, 1924)  
Syn.: *Eurycaenis* Bengtsson, 1917  
(Typus : *Brachycercus harrisella* Curtis, 1834 - monotypy) - syn. Lestage, 1924

23. *Brachycercus harrisella* Curtis, 1834

Superfamily **Ephemerelloidea** Demoulin, 1958  
Family **Ephemerellidae** Klapalek, 1909  
(13 species in Europe, 5 in Romania)

**Genus *Ephemerella*** Walsh, 1862  
(Typus : *Ephemerella excrucians* Walsh, 1862 – design. Eaton, 1868)  
Syn.: *Chitonophora* Bengtsson, 1908  
(Typus : *Ch. aurivillii* Bengtsson, 1908 - monotypy ) - syn. Walley, 1930

24. *Ephemerella mucronata* (Bengtsson, 1909)  
Syn.: *Chitonophora mucronata* Bengtsson, 1909  
*Chitonophora krieghoffi* Ulmer, 1919

25. *Ephemerella notata* Eaton, 1887

**Genus *Serratella*** Edmunds, 1959  
(Typus : *Ephemerella serrata* Morgan, 1911 – design. Orig.)

26. *Serratella ignita* (Poda, 1761)  
Syn.: *Ephemerella ignita* Poda, 1761  
- *Serratella mesoleuca* (Brauer, 1857)  
Species cited by Petrovici apud Gáldean, 1989 – unpublished thesis.

**Genus *Torleya*** Lestage, 1917  
(Typus : *Torleya belgica* Lestage, 1917 - monotypy)

27. *Torleya major* (Klapalek, 1905)  
Syn.: *Torleya belgica* Lestage, 1917

**Subordinul Pisciforma McCafferty, 1991**

Family **Ametropodidae** = Ametropidae Bengtsson, 1913  
(4 species in Europe, one in Romania)

**Genus *Ametropus*** Albarda, 1878  
(typus : *A. fragilis* Albarda, 1878- monotypy)

28. *Ametropus fragilis* Albarda, 1878  
Family **Ameletidae** McCafferty, 1991  
(2 species in Europe, one in Romania)

**Genus *Ameletus*** Eaton, 1885  
(Typus : *A. subnotatus* Eaton, 1885 – design. Orig.)

29. *Ameletus inopinatus* Eaton, 1887  
Superfamily **Baetoidea** Ulmer, 1920  
Family **Baetidae** (=Baetida) Leach, 1815  
(82 species in Europe, 23 in Romania)

**Genus *Baetis*** Leach, 1815  
(Typus : *Ephemera fuscata* Linnaeus, 1761 – design. ICZN)

Subgenus ***Baetis* s. str.**

30. *Baetis (Baetis) fuscatus* (Linnaeus, 1761)  
Syn.: *Baetis bioculatus* (Linnaeus, 1758)  
31. *Baetis (Baetis) vernus* Curtis, 1834  
32. *Baetis (Baetis) scambus* Eaton, 1870  
33. *Baetis (Baetis) lutheri* Müller-Liebenau, 1966

SubGenus ***Nigrobaetis*** Kazlauskas (in Novikova & Kluge, 1987)  
(Typus : *Ephemera nigra* Linnaeus, 1761– design. orig.)  
Syn.: *Alainites* Waltz & McCafferty, 1994  
(Typus : *Ephemera mutica* Linnaeus, 1758 - design. orig.)

34. *Baetis (Nigrobaetis) niger* (Linnaeus, 1761)  
35. *Baetis (Nigrobaetis) muticus* Linnaeus, 1758  
Syn. : *Baetis pumilus* (Burmeister, 1839)  
36. *Baetis (Nigrobaetis) gracilis* Bogoescu & Tabacaru, 1957

Subgenus **Patites** Thomas & Dia, 2000  
(Typus : *Baetis baroukianus* Thomas & Dia, 1984 – design. orig.)  
(*Baetis* gr. *Alpinus* - Müller-Liebenau, 1969)

37. *Baetis (Patites) alpinus* Pictet, 1843

Syn.: *Baetis carpaticus* Morton, 1910  
*Baetis doriei* Degrange, 1957

38. *Baetis (Patites) melanonyx* (Pictet, 1843)

Syn.: *Baetis kulindrophthalmus* Bogoescu, 1933  
*Baetis principii* Grandi, 1949  
*Baetis bengtssoni* Müller-Liebenau, 1966

Subgenus **Rhodobaetis** Jacob, 2003  
(Typus : *Baetis rhodani* Pictet, 1843-45 - design. orig.)  
(*Baetis* gr. *rhodani* - Müller-Liebenau, 1969)

39. *Baetis (Rhodobaetis) rhodani* Pictet, 1843-45

Subgenus **Labiobaetis** Novikova & Kluge, 1987  
(Typus: *Baetis atrebatinus* Eaton, 1870 - design. orig.)  
(*Baetis* gr. *atrebatinus* - Müller-Liebenau, 1969)

40. *Baetis (Labiobaetis) tricolor* Tshernova, 1928

**Genus Acentrella** Bengtsson, 1912  
(typus: *Acentrella lapponica* Bengtsson, 1912- monotypy)

41. *Acentrella sinaica* Bogoescu, 1931

42. *Acentrella hyaloptera* (Bogoescu, 1951)

Syn.: *Pseudocloeon hyalopterum* Bogoescu, 1951  
- *Acentrella inexpectata* (Tshernova, 1928)

Syn.: *Pseudocloeon inexpectatum* Tshernova, 1928  
Species cited by Petrovici apud Gâldean, 1989 – Unpublished thesis.

**Genus Centroptilum** Eaton, 1869  
(typus : *Ephemera luteola* Muller, 1776 design.orig.)

43. *Centroptilum luteolum* (O.F. Müller, 1776)

**Genus Baetopus** Keffermuller, 1960  
(Typus: *Baetopus wartensis* Keffermuller, 1960 – design. orig.)  
Syn.: *Raptobaetopus* Muller-Liebenau, 1978

44. *Baetopus tenellus* (Albarda, 1878)

Syn.: *Centroptilum tenellum* Albarda, 1878

**Genus Cloeon** Leach, 1815  
(Typus: *Ephemera diptera* Linnaeus, 1761 - monotypy)

46. *Cloeon inscriptum* Bengtsson,

45. *Cloeon dipterum* (Linnaeus, 1761)

Syn. : *Ephemera diptera* Linnaeus, 1761

47. *Cloeon simile* Eaton, 1870

**Genus Procloeon** Bengtsson, 1915  
(Typus: *Cloeon bifidum* Bengtsson, 1912 – monotypy)

48. *Procloeon bifidum* Bengtsson, 1912

Syn.: *Cloeon ruffulum* Muller, 1776 – synonymy Kimmins, 1957

49. *Procloeon pennulatum* (Eaton 1870)



50. *Procloeon pulchrum* (Eaton, 1885)  
 Syn.: *Centroptilum pulchrum* Eaton, 1885 – synonymy Jacob, 1991  
*Centroptilum dacicum* Bogoescu & Tabacaru, 1966 – synonymy established with *C. pulchrum* by  
 Keffermüller & Sova, 1975
52. *Procloeon unguiculatum* (Tshernova, 1941)  
 Syn.: *Pseudocentroptilum motasi* Bogoescu, 1947 – Kluge & Novikova, 1992
- Genus** *Pseudocentroptiloides* Jacob, 1987 (in Jacob & Glazaczow)  
 (Typus: *Centroptilum nana* Bogoescu, 1951  
 Syn.: *Pseudocentroptilum shadini* Kazlauskas, 1964 – design. orig.)
53. *Pseudocentroptiloides nana* (Bogoescu, 1951)  
 54. *Pseudocentroptiloides romanica* (Bogoescu, 1949)
- Family **Siphonuridae** Ulmer, 1920  
 (14 species in Europe, 4 in Romania)
- Genus *Siphonurus* Eaton, 1868  
 (Typus: *Baetis flavida* Pictet, 1865 – design. orig.)
55. *Siphonurus aestivalis* Eaton, 1903  
 - *Siphonurus alternatus* Say, 1824  
 Species cited by Petrovici apud Gâldean, 1989 – Unpublished thesis.
56. *Siphonurus armatus* Eaton, 1870  
 57. *Siphonurus lacustris* Eaton, 1870

#### Suborder Setisura McCafferty, 1991

Superfamily **Heptagenoidea** Needham in Needham & Betten, 1901

**Family Heptageniidae** Needham, 1901  
 (142 species in Europe, 27 in Romania)

**Genus Heptagenia** Walsh, 1863  
 (Typus: *Palingenia flavescens* Walsh, 1863 – design. Eaton, 1868)

58. *Heptagenia coeruleans* Rostock, 1878  
 59. *Heptagenia flava* Rostock, 1878  
 60. *Heptagenia longicauda* (Stephens, 1835)  
 Syn.: *Heptagenia flavipennis* Dufour, 1841  
 61. *Heptagenia sulphurea* (Mülle, 1776)

**Genus Ecdyonurus** Eaton, 1868  
 (Typus: *Ephemera venosa* Fabricius, 1779 – design. orig.)

62. *Ecdyonurus aurantiacus* (Burmeister, 1839)  
 Syn.: *Ecdyonurus fluminum* Pictet 1843  
 - *Ecdyonurus carpaticus* Sowa, 1973  
 Species cited by Petrovici apud Gâldean, 1989 – Unpublished thesis.  
 - *Ecdyonurus dispar* (Curtis, 1834)  
 Species cited by Petrovici apud Gâldean, 1989 – Unpublished thesis.
63. *Ecdyonurus forcipula* (Pictet, 1834)  
 64. *Ecdyonurus helveticus* (Eaton, 1885)  
 65. *Ecdyonurus insignis* (Eaton, 1870)  
 - *Ecdyonurus macani* Thomas & Sowa, 1970  
 Species cited by Petrovici apud Gâldean, 1989 – Unpublished thesis
66. *Ecdyonurus subalpinus* Klapalek, 1907  
 - *Ecdyonurus submontanus* Landa 1969  
 Species cited by Petrovici apud Gâldean, 1989 – Unpublished thesis  
 - *Ecdyonurus torrentis* Kimmins, 1942  
 Species cited by Petrovici apud Gâldean 1989 – Unpublished thesis.

65. *Ecdyonurus venosus* (Fabricius, 1775  
- *Ecdyonurus zelleri* Eaton, 1885  
Species mentionata de Petrovici apud unpublished PhD thesis.

**Genus *Electrogena*** Zurwerra & Tomka, 1985  
(Typus : *Baetis lateralis* Curtis, 1834 – design. orig.)

68. *Electrogena lateralis* Curtis, 1834  
- *Electrogena affinis* Eaton 1885  
Species mentioned by Petrovici apud unpublished PhD thesis.  
- *Electrogena quadrilineata* Landa, 1969  
Species mentioned by Petrovici apud unpublished PhD thesis  
- *Electrogena ujhelyii* Sowa, 1981  
Species mentioned by Petrovici apud unpublished PhD thesis.

**Genus *Epeorus*** Eaton, 1881  
(Typus : *Epeorus torrentium* Eaton, 1881 – design. Orig.)

69. *Epeorus assimilis* Eaton, 1885  
70. *Epeorus alpicola* (Eaton, 1871)  
- *Epeorus sylvicola* Pictet, 1885  
Species cited by Petrovici apud Gâldean, 1989 – unpublished thesis

**Genus *Kageronia*** Matsumura, 1931  
(Typus : *Kageronia suzukiella* Matsumura, 1931 – monotypy)

71. *Kareronia fuscogrisea* (Retzius, 1783)

**Genus *Rhithrogena*** Eaton, 1881  
(Typus : *Baetis semicolorata* Curtis 1834 – design. orig.)

72. *Rhithrogena semicolorata* (Curtis, 1834)  
73. *Rhithrogena alpestris* Eaton, 1885  
74. *Rhithrogena savoiensis* Alba-Tercedor & Sowa, 1987  
Syn.: *Rhithrogena aurantiaca* sensu Bogoescu, 1958 (partim)  
75. *Rhithrogena beskidensis* Alba-Tercedor & Sowa, 1987  
Syn.: *Rhithrogena aurantiaca* sensu Bogoescu, 1958 (partim)  
76. *Rhithrogena bogoescui* Sowa & Degrange, 1987  
Syn.: *Rhithrogena alpestris* sensu Bogoescu, 1858  
- *Rhithrogena carpatoalpina* Klonowska, Olechowska, Sartori & Weiselbaumer, 1978  
Species cited by Petrovici apud Gâldean 1989 – unpublished thesis  
77. *Rhithrogena sowai* Putz, 1972  
Syn. : *Rhithrogena germanica* sensu Bogoescu, 1958  
- *Rhithrogena hybrida* Eaton, 1885  
Species cited by Petrovici apud Gâldean 1989 – unpublished thesis  
- *Rhithrogena iridina* (Kolenati, 1839)  
Species cited by Petrovici apud Gâldean 1989 – unpublished thesis  
- *Rhithrogena nivata* Eaton, 1871  
Species mentioned by Petrovici in his unpublished PhD thesis

**Family *Isonychiidae*** Burks, 1953

**Genus *Isonychia*** Eaton, 1871  
(Typus.: *Isonychia manca* Eaton, 1871 – desig. Orig)

76. *Isonychia ignota* (Walker, 1853)

**Family Oligoneuriidae** Ulmer, 1914  
(in Europe 7 specii, in Romania 2)

**Genus Oligoneuriella** Ulmer, 1924

77. *Oligoneuriella rhenana* (Imhoff, 1825)

- *Oligoneuriella pallida* Hagen, 1855

Species cited by Petrovici apud Gâldean, 1989 – unpublished thesis

### CONCLUSIONS

In terms of its systematic study, **Order Ephemeroptera** represents one of the most difficult insect orders.

In our country, the most serious problems of systematics are raised by families *Baetidae* and *Heptageniidae* due to the fact that they are the richest in species, as well as because they have suffered from the most numerous changes in nomenclature and from repeated synonymies.

### ABSTRACT

Our research, conducted between 2003-2011 on the Order Ephemeroptera from Romania discovered some inconsistencies in the systematic classification of this order. As a result, considering the current data in Ephemeroptera systematics and the numerous reviews and synonymies that have been established, we propose a new species concept on this insect order of our country.

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