

Quantitative records of larvae of Ephemeroptera, Odonata and Plecoptera from the Zakarpats'ka Region, Ukraine (2004, 2006)

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ABSTRACT: The first part of this paper (Tables 1-2) provides data on 38 Ephemeroptera, 3 Odonata and 19 Plecoptera taxa from the Zakarpats'ka Region, Ukraine. The species *Taeniopteryx auberti* Kis & Sowa, 1964 and *T. schoenemundi* (Mertens, 1923) are recorded in the first time from Ukraine. The following species are new to Zakarpats'ka Region and Tysa River: *Cloeon dipterum* (Linnaeus, 1761), *Kageronia fuscogrisea* (Retzius, 1783) (Borzhava), *Isogenus nubecula* Newman, 1833 (Rika, Teresva, Tysa). The second part (Tables 3-5) is a still unpublished data list of GODUNKO & KOVÁCS (2008).

Introduction

This paper is divided into two parts. The first part (Tables 1-2) contains results of a quantitative sampling focused on the Tysa and its inflows (06.05.2004-07.05.2004, 29.06.2004-30.06.2004, 19.10.2004-20.10.2004). The water courses investigated are Chorna Tysa, Bila Tysa, Tysa (six sampling spots), Shopurka, Apshytisia, Teresva, Tereblia, Rika, Borzhava. Faunistic results of this work were published by KOVÁCS & GODUNKO (2008).

Composit type samples were taken using the “kick and sweep” method. Three semiquantitative samples were taken from five meter long sections at each sampling spot. This meant the sampling of a 3.75 m² (3 × 1.25 m²) area at each site. The three separately processed samples represented characteristic habitat-types of the given river-section. The collectors are Péter Juhász, Béla Kiss and Zoltán Müller.

The Ephemeroptera and Plecoptera material on which the present part is based has been preserved in 70% ethanol and housed in the Mátra Museum (Gyöngyös, Hungary).

Identification of the genera: *Caenis luctuosa/macrura*, *Ecdyonurus*, *Rhithrogena* (Ephemeroptera); *Amphinemura*, *Chloroperla*, *Dinocras cephalotes/megacephala*, *Isoperla*, *Leuctra*, *Nemoura*, *Perla marginata/pallida*, *Perlodes*, *Protonemura*, *Rhabdiopteryx*, *Siphonoperla* (Plecoptera) is still in progress.

The second part (Tables 3-5) contains the unpublished data on which GODUNKO & KOVÁCS (2008) provided information and conclusions. Only one quantitative record was published in that paper, namely that of *Baetis beskidensis* Sowa, 1972 which was reported as new to Ukraine.

Table 1. Taxonomical composition and number of collected Ephemeroptera, Odonata, Plecoptera specimens of the Choma Tysa, Bila Tysa, Tysa River (2004)

	I/1.			I/2.			I/3.			I/4.			I/5.			I/6.			I/7.			I/8.		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
<i>Acantrella sinatica</i>		3																						
<i>Baetis alpinus</i>	25			11																				
<i>B. fuscatus</i>					12		26	1				28	1		28	2		27	18				63	24
<i>B. gracilis</i>																		31					1	
<i>B. lutheri</i>	7	13		14	2		5			6		3			1		2							
<i>B. melanonyx</i>	2																							
<i>B. muticus</i>	5						3	1				1					8							
<i>B. rhodani</i>	36	5	6	30			9		9			9	1	1	1		3				3			
<i>B. scambus</i>	26	1			20		13		2			17			14	12	44				11			
<i>B. vardarensis</i>							2		1			2												
<i>B. vernus</i>	6							1																
<i>Caenis beskidensis</i>															2			23				16		
<i>C. luctuosad/macrura</i>															1			2				3		
<i>C. pseudovivulorum</i>																		3	4			35	3	
<i>Centropitilum pulchrum</i>																							5	
<i>Ecdyonurus</i> sp.	14	1	8	3	1	12	9	36	6	17	21	57	1	2	6	1	9	7	16	11	11	240	20	
<i>Electrogena lateralis</i>	1				3	2							1		1									
<i>Epeorus assimilis</i>	3		3						4					2										
<i>Ephemerella lineata</i>															1				1					
<i>Ephemerella mucronata</i>	14			21			16		48			10			2						1			
<i>Habroleptoides confusa</i>	22	8	1				2	1			1									1				
<i>Heptagenia coenulans</i>																	4						5	
<i>H. sulphurea</i>															4	2	9	1	1	34		1	5	
<i>Oligoneuriteella rhemana</i>																230		19				20		
<i>Paraleptophlebia submarginata</i>															1						1		3	
<i>Potamanthus luteus</i>																								3
<i>Rhiithrogena</i> sp.	154	156	139	4	7	6	189	78	101	151	32	81	47	22	10	24	37	31	155	14	20	33		2
<i>Serratella ignita</i>	10				24		69				42			7		6		46					17	
<i>Torleya major</i>	5	1	4	3	2	1									6			2	5			7		
Ephemeroptera Σ	280	229	169	90	72	19	235	342	114	240	489	141	89	60	17	62	322	44	232	208	56	104	413	60
<i>Onychogomphus forcipatus</i>										1		1	1	0	0	5	2	0	4	1	0	5	2	0
Odonata Σ	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	5	2	0	4	1	0	5	2	0

	I/1.			I/2.			I/3.			I/4.			I/5.			I/6.			I/7.			I/8.			
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	
<i>Amphinemura</i> sp.	3						1																		
<i>Brachyptera risi</i>			1																						
<i>B. seticornis</i>	2		4				1																		
<i>Chloroperla</i> sp.	7	1	1	9	1	6																			
<i>Dinoceras cephalotes/megacephala</i>	1	1	1																		1				
<i>Isogenus nubecula</i>	62	17	13	2	15	52																		6	
<i>Leuctra</i> sp.	16	4	1	1	2	3	2	1																	
<i>Nemoura</i> sp.																									
<i>Perla bipunctata</i>																									
<i>P. burmeisteriana</i>																									
<i>P. grandis</i>																									
<i>P. marginata/pallida</i>	1	2	5	5	7	8				2	1	3													
<i>Perlodes</i> sp.	4		13			75				4		5	1	1											
<i>Protonemura</i> sp.							2																		
<i>Rhabdiopteryx</i> sp.			1																						
<i>Siphonoperla</i> sp.	2			1																					
<i>Taeniopteryx auberti</i>			2			5																			
<i>T. schoenenundi</i>																									
Plecoptera Σ	98	23	25	24	7	92	32	3	9	59	2	9	25	0	3	5	0	7	50	1	10	6	0	10	
Total number of specimens	378	252	194	114	79	111	267	345	123	300	491	150	115	60	20	72	324	51	286	210	66	115	415	70	

I/1. = Chorna Tysa (Feketesíza: Fekete-Tisza); a = 07.05.2004, b = 29.06.2004, c = 20.10.2004 – I/2. = Roztoky: Bila Tysa (Nyílás: Fehér-Tisza); a = 07.05.2004, b = 29.06.2004, c = 20.10.2004 – I/3. = Vil'khovaty: Tysa (Kiscserjés, Tisza); a = 07.05.2004, b = 29.06.2004, c = 20.10.2004 – I/4. = Kholmiv: Tysa (Kömlös: Tisza); a = 06.05.2004, b = 29.06.2004, c = 20.10.2004 – I/5. = Luh: Tysa (Lonka, Tisza); a = 06.05.2004, b = 29.06.2004, c = 19.10.2004 – I/6. = Tiachiv: Tysa (Técső: Tisza); a = 06.05.2004, b = 29.06.2004, c = 19.10.2004 – I/7. = Vyshkiv: Tysa (Visk: Tisza); a = 06.05.2004, b = 29.06.2004, c = 19.10.2004 – I/8. = Tekovo: Tysa (Tekeháza: Tisza); a = 07.05.2004, b = 30.06.2004, c = 19.10.2004.

Table 2. Taxonomical composition and number of collected Ephemeroptera, Odonata, Plecoptera specimens of the tributaries of the Tysa River: Shopurka, Apshtyisia, Teresva, Tereblia, Rika, Borzhava (2004)

	II.			III.			IV.			V.			VI.			VII.		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
<i>B. beskidensis</i>		4																
<i>B. buceratus</i>																1		
<i>B. fuscatus</i>		7		3	5		12	1		6			15	3	1			
<i>B. gracilis</i>							2											
<i>B. lutheri</i>	34						1											
<i>B. muticus</i>	2		1	4			7											
<i>B. rhodani</i>	5		1	3			2		1			2			4			
<i>B. scambus</i>		1			1								2					
<i>B. tricolor</i>																		2
<i>B. vardarensis</i>	49		1	2	2		28	3	5	3	16	4	8	7		2		
<i>B. vernus</i>							1											
<i>Caenis beskidensis</i>								2			9							
<i>C. luctuosa/macrura</i>				2	16			2			2		2		3	1	1	
<i>C. pseudovivolorum</i>					1					3			1					
<i>Centropitulum pulchrum</i>											1		2					
<i>Choroterpes picteti</i>																		
<i>Cloeon dipterum</i>																		2
<i>Ecdyonurus</i> sp.	8	4	9	6	36	1	4	29	20	2	25	5	32	17	10	5		
<i>Electrogena affinis</i>																		4
<i>E. lateralis</i>				5						3		2						
<i>Epeorus assimilis</i>	5		13					1										1
<i>Ephemera lineata</i>									1									6
<i>E. vulgata</i>																		
<i>Ephemerella mucronata</i>	46						2											
<i>Habroleptoides confusa</i>									6									
<i>Heptagenia coeruleans</i>										1								
<i>H. sulphurea</i>											1	2	3	1	16	1	1	
<i>Kageronia fuscognisea</i>																		1
<i>Oligoneuriella rhenana</i>								698		760				621				
<i>Paraleptophlebia submarginata</i>		458			38				2			1		2				64
<i>Potamanthus luteus</i>			1															7
<i>Proclleon bifidum</i>																		16

	II.			III.			IV.			V.			VI.			VII.		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
<i>Rhithrogena</i> sp.	133	39	91	1	28	7	97	9	52	1	1	101	17	75	2			
<i>Serratella ignita</i>		44			16			32		39			33					
<i>Torteya major</i>	5		4				5		2	2		1						
Ephemeroptera Σ	287	557	121	23	141	14	146	789	91	9	863	10	122	735	114	26	37	74
<i>Gomphus vulgatissimus</i>																		2
<i>Onychogomphus forcipatus</i>	2	1	6	7	10		1			5	5	20	1	1				
<i>Platynemis pennipes</i>																2	1	3
Odonata Σ	2	1	6	7	10	0	1	0	0	5	5	20	1	1	0	2	1	5
<i>Amphinemura</i> sp.	1						1											
<i>Brachyptera risi</i>	1																	
<i>Chloroperla</i> sp.	5																	
<i>Dinoceras cephalotes/megacephala</i>	1																	
<i>Isogenus nubecula</i>									1									
<i>Isoperla</i> sp.	29						31						1					
<i>Leuctra</i> sp.			2		2				18	1				8	4			
<i>Nemoura</i> sp.																		1
<i>Pera bipunctata</i>							1	1										
<i>P. burmeisteriana</i>			1															
<i>P. marginata/pallida</i>	8	2	6															
<i>Perlodes</i> sp.			13						6									
<i>Taeniopteryx auberti</i>			1															
<i>T. schoenemundi</i>			17						18									15
Plecoptera Σ	45	2	40	0	2	0	33	1	44	0	1	0	1	9	20	1	0	0
Total number of specimens	334	560	167	30	153	14	180	790	135	14	869	30	124	745	134	29	38	79

II. = Velykyi Bychkiv; Shoporuka (Nagyboeszkő: Sopurka); a = 06.05.2004, b = 29.06.2004, c = 20.10.2004 – III. = Dibrova; Apshytisia (Alsóapsa: Apsica); a = 07.05.2004, b = 30.06.2004, c = 20.10.2004 – IV. = Teresva (Taracköz: Tarac); a = 07.05.2004, b = 30.06.2004, c = 19.10.2004 – V. = Bushtyno; Tereblia (Bustyaháza: Talabor); a = 07.05.2004, b = 30.06.2004, c = 19.10.2004 – VI. = Iza; Rika (Iza: Rika (Iza: Nagy-ág); a = 07.05.2004, b = 30.06.2004, c = 19.10.2004 – VII. = Bene; Borzhava (Bene: Borzsa); a = 07.05.2004, b = 30.06.2004, c = 19.10.2004.

UZa0506	UZa0606	UZa0806	UDu0506	UDu0606	UDu0806	UPe0506	UPe0606	UPe0806	UOn0506	UOn0606	UOn0806	LSa0506	LSa0606	LSa0806	LCh0406	LCh0506	LCh0606	LKa0506	LKa0606	LKa0806	LMG0506	LMG0606	LMG0806	BHr0506	BHr0606	BHr0806	BKhm0506	BKhm0606	BKhm0806	BBen0506	BBen0606	BBen0806	BVa0506	BVa0606	BVa0806				
	6	2										37	13	4	3	3		1	1	7																			
<i>Toxeya major</i>												4																											
<i>Ephemerella micronata</i>															1																								
<i>Serratella ignita</i>	96	255	123	105	123	73	291	182	124	162	150	122	17	217	22		223	207						25	34	14	17	20	19	6	6	9							
<i>Caesia luctuosa</i>		5	2	3	2	7	6	2	1						4	2	5	6						17	1	5	15	13	13	6	4	4	10	8	15				
<i>C. macrura</i>																		2	9																				
<i>C. pseudovivitorum</i>																																							
<i>C. robusta</i>																																							
<i>Habrophlebia fusca</i>									2	3	5																												
<i>H. lauta</i>																																							
<i>Paraleptophlebia cinca</i>																																							
<i>P. submarginata</i>																																							
<i>Ephemerella danica</i>		3	1						1																														
<i>E. vulgata</i>																																							
<i>Potamanthus lituus</i>																																							
Total number of specimens	407	790	467	416	395	291	758	613	358	632	672	451	260	158	215	344	270	839	821	16	28	53	2	4	8	218	162	141	155	212	129	61	73	42	65	114	73		
Σ	6250 specimens: 6191 – larvae; 59 – imagoes female											4018 specimens: 3994 – larvae; 24 – imagoes female											1445 specimens of larvae																

Remarks. The localities of the Uzh River: UZab0506-0806 – 2 km up of Zabrid' village; UDub0506-0806 – Dubrynichi village, near the bridge towards Chornoholova village; UPer0506-0806 – Perechyn town, near of the mouth of Turia River; UOno0506-0806 – vicinity of Onokivtsi village, near the bridge towards Ortkhovysia village; the localities of the Latorysia River: LSva0506-0806 – Svaliava town, near the bridge towards Mukacheve town; LCha0406-0806 – Chamadievo village, near railway station; LKol0506-0806 – Kolchyno village, near railway station; LMG0506-0806 – 3 km S of Mali Heivtsi village, near the bridge towards Chop town; the localities of the Borzhava River: BHre0506-0806 – Hreblia village, near the bridge towards Vilkhivka village; BKhm0506-0806 – 2 km S of Khmilnyk village; BBen0506-0806 – Bene village, near the bridge towards Berehove-Vilok; BVa0506-0806 – Vary village, near the bridge in the village centre.

The dates of sampling of mayflies (Insecta: Ephemeroptera) of the basins of the Uzh River (1), the Latorysia River (2) and Borzhava River (3): 1 – 04.05.2006, 14-15.06.2006, 05.08.2006; 2 – 30.04.2006, 05.05.2006, 16.06.2006, 06.08.2006; 3 – 06.05.2006, 17.06.2006, 07.08.2006.

UZab0506

A

The acronym of locality

The date

of sampling (April, 2006)

Results and discussion

Thirty-eight Ephemeroptera (8246 specimens, 328 data), 3 Odonata (88 specimens, 23 data) and 19 Plecoptera taxa (699 specimens, 106 data) have been recorded from 14 sites sampled between 6th May 2004 and 20th October 2004 in the Zakarpats'ka Region, Ukraine. *Taeniopteryx auberti* Kis & Sowa, 1964 and *T. schoenemundi* (Mertens, 1923) are new to Ukraine (cf. GODUNKO & KLONOWSKA-OLEJNIK 2003, GODUNKO & KOVÁCS 2008, GODUNKO *et al.* 2004, KHARCHENKO *et al.* 2003, KOVÁCS 2006, KOVÁCS & GODUNKO 2008, ZHILTZOVA 2003).

The following species represent new records to the Zakarpats'ka Region and Tysa River: *Cloeon dipterum* (Linnaeus, 1761), *Kageronia fuscogrisea* (Retzius, 1783) (Borzhava), *Isogenus nubecula* Newman, 1833 (Rika, Teresva, Tysa) (cf. CSER 2003, CSER & ANDRIKOVICS 2001, GÁLDEAN 1999, GODUNKO 2000, GODUNKO & KOVÁCS 2008, KOVÁCS 2006, KOVÁCS & GODUNKO 2008, MOCSÁRY 1900, ZHILTZOVA 1967, 1968).

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