

## CHECKLIST AND DISTRIBUTION OF CLADOCERA AND COPEPODA (CALANOIDA, CYCLOPOIDA) FROM THE UKRAINIAN CARPATHIANS

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**Abstract:** There are known 98 species (11 families and 46 genera) of Cladocera and Copepoda (Calanoida, Cyclopoida) from the Ukrainian Carpathians. The total number of water bodies in the region is more than 300. For the first time there were investigated 230 of them. The checklist considers distribution of the species in this region (type of the water bodies, elevation a.s.l., basins of the main rivers, mountain massifs). Five species (*Alona protzi* Hartwig 1900, *Sinodiaptomus sarsi* Rylov 1923, *Acanthocyclops venustus* Norman et. Scott 1906, *Eucyclops subterraneus* Graeter 1907, *Graeteriella unisetigera* Graeter 1908) have been found for the first time on the territory of Ukraine and three species (*Moina macrocopa* Straus 1820, *Ectocyclops affinis* G.O. Sars 1863, *Tropocyclops prasinus* Fischer 1860) have been found for the first time on the territory of the Ukrainian Carpathians during our research. Eight species are known for Ukraine only from the Carpathian Mountains. Two species, *Chydorus sphaericus* O.F. Müller 1776 and *Daphnia obtusa* Kurz 1874, were found over 1900 m a.s.l. (alpine pools of the Chornohora massif). The fauna of Synevyr Lake is one of the richest in the investigated area. There are present 31 species of Cladocera and Copepoda (Cyclopoidae, Calanoidae). The fauna of such mountain massifs as Chornohora (40 species), Svydivets (46 species) and Watershed Gorgany (42 species) is the most diverse in the Ukrainian Carpathians.

**Keywords:** biodiversity, checklist, Cladocera, Copepoda, Ukrainian Carpathians

### Introduction:

The investigation of fauna of plankton crustaceans in the Ukrainian Carpathians was started in 1885-86 by Wiśniowski (1888). He highlighted 11 species. The research of Cladocera fauna was continued by Wolski (1935) – as well 11 species. The most important contribution for the study of plankton crustaceans of the Ukrainian Carpathians was made by Polischuk and

Garasevitch (1986), Terek (1983; 1993; 1999 and Terek et al. 2004). In the publication of Polischuk and Garasevitch there are mentioned 55 species and in the publications of Terek and Terek et al. 39 species. A total of 30 publications contain original data about species of Cladocera and Copepoda (except Harpacticoida) in this region. Harpacticoids have been previously inventoried by Kovalchuk (1997). In our overview this group is not described. Monchenko (2003) provided the first inventory of Cyclopoida of the Ukrainian Carpathians. His list includes 33 species. Five species from this mountain region are to be found in the checklist of the Ukrainian Calanoidae (Samchyshyna 2011). The array of publications displays information about 46 species of Cladocera

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altogether. The current data about species diversity in the region of the Ukrainian Carpathians lacks. Most of the publications describe crustacean's fauna typical only of some water bodies of the region: lakes of Chornohora massif, lake Synevyr, Tereblya reservoirs and the main Carpathian rivers – Tisza and Prut. Only a tenth part of the territory of the Ukrainian Carpathians has been investigated till now. The distribution of 98 species of plankton crustaceans in the Ukrainian Carpathians is given in this article.

### Materials and methods:

The area of the Ukrainian Carpathians is about 24 thousand km<sup>2</sup> (Nature of the Ukrainian Carpathians 1968). The main typical planktocenoses of this region comprise the groups of glacial lakes in Chornohora and Svydivets massifs, subalpine pools and puddles in some other massifs, some lakes in the forest zone (Synevyr, Hirske Oko, Zhuravlyne and others) and different ponds below 900 m a.s.l. Specific planktocenoses are formed in mountain swamps, roadside pools, shallow stretches of rivers and streams, springs and wells, groundwaters.

In previous publications we learn about 60 investigated water bodies in the Ukrainian part of Carpathian Mountains, but some of publications do not contain detailed information about the location of reservoirs, so their number may be higher. Some records include places which do not refer to the Carpathian region (caves of Ternopil region, lowland reservoirs of Lviv, Ivano-Frankivsk, Zakarpattia regions and foothill rivers). We consider the mountain area above 200 m a.s.l. with typical mountain landscapes. We observed 260 water bodies of the Ukrainian Carpathians during 2001–2014 years (Fig. 1). 230 of them were investigated for the first time. The total number of the investigated water bodies in this region exceeds 300. The cyclopoid classification schemes and species distribution in the world that we used is

depicted by Walter and Boxshall (2015); calanoid – Borutzky et al. (1991) and Boxshall and Defaye (2009); cladocera – Kotov et al. (2013). The materials of this research are stored in the author's archive collection.

### Results and discussion:

The checklist of the known species of plankton crustaceans is submitted in the Table 1 (Annexes). This table unfolds the list of 98 species (48 - Cladocera, 50 - Copepoda) known in the water bodies of the Ukrainian Carpathians, their distribution (type of the water body, elevation a.s.l. river basins, mountain massifs) and the authors, who observed the species in region.

Five species are common in most of the massifs and river basins of this area: *Chydorus sphaericus* O.F. Müller 1776, *Alona quadrangularis* O.F. Müller 1776, *Acanthocyclops vernalis* Fischer 1853, *Eucyclops serrulatus* Fischer 1851 and *Paracyclops fimbriatus* Fischer 1853. Other species were found within the restricted territories.

The majority of the species are found in low and middle levels (85 – to 500 m a.s.l.; 87 – 500 – 1000 m a.s.l.) of the investigated area. Most of them are typical lowland species. 37 species were registered upper than 1500 m a.s.l., 11 species of them were spotted between 1800 – 1900 m a.s.l.

In the alpine pools of the Chornohora massif, over 1900 m a.s.l., were found two species: *Chydorus sphaericus* O.F. Müller 1776 and *Daphnia obtusa* Kurz 1874.

Most of the investigated water bodies are situated between 1600 – 1700 m a.s.l. (37) and 400 – 500 m a.s.l. (44). The remaining reservoirs are distributed at other altitude levels.

The eudominant species (over 10% of the total density) of subalpine and alpine communities are *Chydorus sphaericus* O.F. Müller 1776, *Daphnia obtusa* Kurz 1874, *Daphnia longispina* O.F. Müller 1776, *Alona affinis* Leydig 1860, *Alona quadrangularis*

O.F. Müller 1776, *Alonella excisa* Fischer 1854, *Peracantha truncata* O.F. Müller 1785, *Eudiaptomus transylvanicus* Daday 1890, *Mixodiaptomus tatricus* Wierzejski 1883, *Acanthocyclops vernalis* Fischer 1853, *Eucyclops serrulatus* Fischer 1851, *Paracyclops fimbriatus* Fischer 1853. *Daphnia cucullata* Sars 1862, *Ceriodaphnia quadrangula* O.F. Müller 1785, *Acroperus harpae* Baird 1834, *Coronatella rectangula* Sars 1862 and *Acanthocyclops robustus* G.O. Sars 1863 occur seldom in highland water bodies.

The rivers hold 68%, lakes 51%, puddles 42% of plankton crustacean's species diversity in the Ukrainian Carpathians. The river biotopes comprise 11% of the species, which occur only there. The hypogenic waters (streams, wells, springs, moss, interstitial, caves) – 9%, where as other water biotopes – less 4% each.

The fauna of lake Synevyr is the richest among the water bodies of the investigated area – 31 species of Cladocera and Copepoda (Cyclopoidae, Calanoidae). The fauna of Chornohora (40 species), Svydivets (46 species) and Watershed Gorgany (42 species) is the most diverse in the Ukrainian Carpathians.

There are 11 families and 46 genera of plankton crustaceans in fauna of the Ukrainian Carpathians. *Daphnia* and *Diacyclops* are the most common and rich genera in this region (nine species each).

Some species mentioned in the publications were not found during our own research. This can be explained by the inaccurate previous species determination by the authors. For example, we did not find any *Eudiaptomus vulgaris* Schmeil 1898 during the research of water bodies in Chornohora, Svydivets massifs and Synevyr Lake, but very often we found there related species – *Eudiaptomus transylvanicus* Daday 1890.

Five species (*Alona protzi* Hartwig 1900, *Sinodiaptomus sarsi* Rylov 1923, *Acanthocyclops venustus* Norman et Scott 1906, *Eucyclops subterraneus* Graeter 1907, *Graeteriella unisetigera* Graeter 1908) were

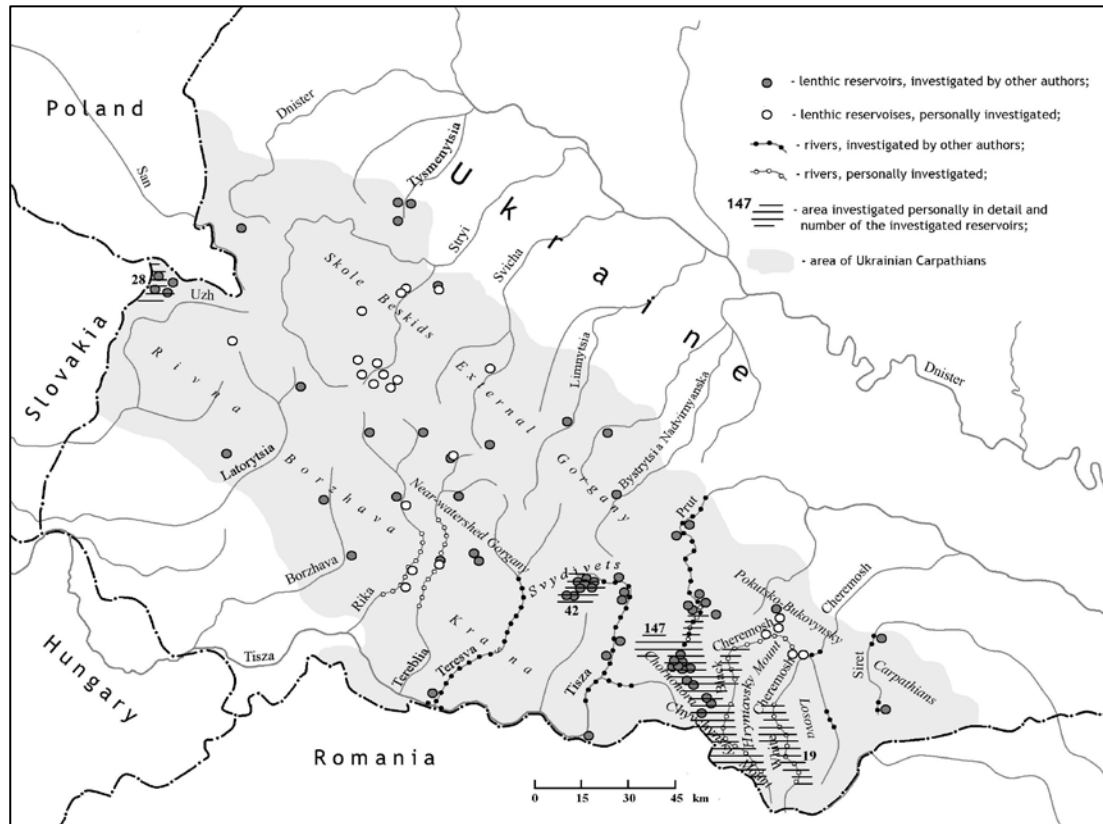
found for the first time on the territory of Ukraine and three species (*Moina macrocopa* Straus 1820, *Ectocyclops affinis* G.O. Sars 1863, *Tropocyclops prasinus* Fischer 1860) were observed for the first time in the area of the Ukrainian Carpathians during the research.

The finding of *S. sarsi* among the new species for Ukraine is one of the most interesting. The area of this species covers Middle and Eastern Asia (Borutzky et al. 1991). The short life-span population of *S. sarsi* in Bulgaria Kiefer (1938) was explained as entry, but the next finding of this species in Turkey (Gündüz 1998) and Ukraine proves that the species area is uncertain. In the Ukrainian Carpathians this species was identified by two male and one female individuals from the pool and ponds in the upper stream of the river Uzh. The question about this species is its unclear invasion or not on this territory is. To answer it, further research in other water bodies near this location and detailed morphometric and genetic analyses are needed.

The main part of Cladocera and Copepoda fauna of the Ukrainian Carpathians consists of cosmopolite (42%) and holarctic species (21%). The other species have mainly palearctic zones with some other zoogeographical zones distribution (26%) and a small part (11%) is presented by European species.

Eight species (*Alona protzi* Hartwig 1900, *Daphnia obtusa* Kurz 1874, *D. rosea* Sars 1862, *Mixodiaptomus tatricus* Wierzejski 1883, *Sinodiaptomus sarsi* Rylov 1923, *Eucyclops subterraneus* Graeter 1907, *Acanthocyclops venustus* Norman et Scott 1906, *Diacyclops cohabitatus* Monchenko, 1980, *Graeteriella unisetigera* Graeter 1908) are known in Ukraine only from the Carpathian mountains.

The further investigations of new water bodies of the Ukrainian Carpathians will expand the present checklist.

**Figure no. 1** Map of plankton crustaceans research in the Ukrainian Carpathians**Conclusions:**

The species diversity of Cladocera and Copepoda of the Ukrainian Carpathians decrease from lowlands to highlands. This mountain territory is a natural border for a few species areas: eastern for *Alona protzi* Hartwig 1900, *Daphnia obtusa* Kurz 1874, *Diacyclops cohabitatus* Monchenko 1980, *Eucyclops subterraneus* Graeter 1907, *Graeteriella unisetigera* Graeter 1908, north-eastern for *Mixodiaptomus taticus* Wierzejski 1883 and western for *Sinodiaptomus sarsi* Rylov 1923. The most common species of plankton crustaceans of the Ukrainian Carpathians is *Chydorus sphaericus* O.F. Müller 1776. There are known 98 species of Cladocera and Copepoda (Calanoida and Cyclopoida) in this mountain territory, but some of big river basins and massifs are either almost not

investigated or have a low number of investigated water-bodies. We may suppose that the diversity of plankton crustaceans in the Ukrainian Carpathians is twice higher.

**Rezumat:**

CATALOGUL ȘI DISTRIBUȚIA  
CLADOCERELOR ȘI COPEPODELOR  
(CALANOIDA, CYCLOPOIDA)  
DIN CARPAȚII UCRAINEI

Sunt cunoscute 98 de specii (11 familii și 46 de genuri) de Cladocere și Copepode (Calanoida, Cyclopoida) din Carpații Ucraineni. Numărul total al bazinelor acvatice din regiune depășește 300. Pentru prima dată au fost investigate 230 dintre acestea. Catalogul prezintă distribuția speciilor din această regiune (tipul de bazin

acvatic, altitudinea peste nivelul mării, principalele râuri, masive montane). Cinci specii (*Alona protzi* Hartwig 1900, *Sinodiaptomus sarsi* Rylov 1923, *Acanthocyclops venustus* Norman et. Scott 1906, *Eucyclops subterraneus* Graeter 1907, *Graeteriella unisetigera* Graeter 1908) au fost descoperite pentru prima dată pe teritoriul Ucrainei și trei specii (*Moina macrocopa* Straus 1820, *Ectocyclops affinis* G.O. Sars 1863, *Tropocyclops prasinus* Fischer 1860) au fost semnalate pentru prima dată în zona Carpaților Ucraineni în timpul cercetărilor noastre. Opt specii sunt cunoscute pentru Ucraina doar în arealul Munților Carpați. Două specii, *Chydorus sphaericus* O.F. Müller 1776 și *Daphnia obtusa* Kurz 1874, au fost descoperite la peste 1900 m deasupra nivelului mării (bălți alpine din masivul Chornohora). Fauna din lacul Synevyr este una dintre cele mai abundente din zona investigată. Sunt prezente 31 de specii de Cladocere și Copepode (Cyclopoidae, Calanoidae). Fauna unor astfel de masive montane, precum Chornohora (40 de specii), Svydivets (46 de specii) și bazinele hidrografice Gorgany (42 specii), este cea mai diversă din Carpații Ucraineni.

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**Annexes:**

**Table no. 1** Checklist and distribution of the species of Cladocera and Copepoda (Calanoida and Cyclopoida) in the Ukrainian Carpathians

No.	Species	Water bodies	Elevation	River basins	Mountain massifs	Authors
	Fam. Daphniidae					
1	<i>Ceriodaphnia pulchella</i> (G.O. Sars, 1862)	Ri, Re	<700	R, Tb, Si, UP	K, NG, PB	PG, Tr, V
2	<i>C. quadrangula</i> (O.F. Müller, 1785)	L, SL	<1900	Tb, UT, UP	NG, C	I, M4, M5, T2, T3, Wo
3	<i>C. reticulata</i> (Jurine, 1820)	SL, Sw, Pu	<1700	BC, St	C, CM, PB, SB	KN2, M5
4	<i>Daphnia atkinsoni</i> (Baird, 1859)	Ri	<800	UP	PB, EG	PG
5	<i>D. cucullata</i> (G.O. Sars, 1862)	L, SL, Pu, Ri	<1800	Tb, UT, BC, WC	NG, S, C, CM, L	I, KN1, M3, M4, M5, Pa, PK, T3
6	<i>D. galeata</i> (G.O. Sars, 1864)	Ri	<1000	UT	S	Pa, PK
7	<i>D. hyalina</i> (Leydig, 1860)	Ri	<800	UP	PB	PG
8	<i>D. longispina</i> (O.F. Müller, 1776)	L, SL, Po, Sw, Re, Ri	<1900	U, Tb, Ts, UT, BC, UP, St	R, NG, K, S, C, EG, SB	B, G1, G2, I, KN1, M1, M2, M4, M5, PG, T1, T2, T3, T4, V, Wi, Wo
9	<i>D. magna</i> (Straus, 1820)	Ri	<800	Ts, UP	K, PB, EG	G1, G2, PG
10	<i>D. obtusa</i> (Kurz, 1874)	L, SL, Pu, Po, Sw	400–2000	U, Ts, UT, BC, UP, L, Sv, St	R, S, C, CM, HM, NG, EG, SB	KN1, KN2, M1, M2, M3, M4, M5, PG, T2, T4, Wi, Wo
11	<i>D. pulex</i> (Leydig, 1860)	Pu, Po, Ri, Re	<1000	U, Tb, WC, UP	R, K, L, PB	M3, M6, PG, Pa, PK
12	<i>D. rosea</i> (G.O. Sars, 1862)	L, Sw, Pu	1400– 1600	Ts, UT	S	T4, M6
13	<i>Simocephalus vetulus</i> (O. F. Müller, 1776)	L, Pu, ORB, Po	<1600	Tb, UT, BC, UP, St	NG, S, C, CM, HM, PB, SB	I, Kn, KN2, M1, M2, M4, M5, M6, T3,
14	<i>Scapholeberis mucronata</i> (O. F. Müller, 1776)	L, Ri	<1600	Tb, Ts, UT, UP	K, NG, S	I, G2, M2, PG, T3, T4
	Fam. Moinidae					
15	<i>Moina brachiata</i> (Jurine, 1820)	Sw, Pu, Po, Ri	<1000	Ts, BC, UP, St	K, CM, HM, PB, EG, SB	G1, G2, KN2, M4, M5, M6, PG
16	<i>M. macrocopa</i> (Straus, 1820)	Pu, Po	<700	U, BC	R, C, PB	M5, M6



17	<i>M. micrura</i> (Kurz, 1875) Fam. Bosminidae	Ri	<1000	UT	S	Pa, PK
18	<i>Bosmina longirostris</i> (O.F. Müller, 1776)	L, SL, Pu, Po, Re, Ri	<1000	U, L, R, Tb, Ts, UT, BC, UP, Si,	R, B, NG, K, S, C, PB	B, Ga, G1, G2, I, KN1, Kn, M5, M6, P, Pa, PG, PK, T1, T2, T3, V
19	<i>B. coregoni</i> (Baird, 1857) Fam. Ilyocryptidae	Re, Ri	<800	Tb, UP	K, PB, EG	PG, V
20	<i>Ilyocryptus agilis</i> (Kurz, 1878)	SL	1500– 1700	UT	C	T2
21	<i>I. sordidus</i> (Liévin, 1848) Fam. Macrothricidae	Ri	<1000	UT, UP	S, PB	KN1, PG
22	<i>Macrothrix hirsuticornis</i> (Norman & Brady, 1867)	L, SL, St	<1800	Tb, UT, BC, UP	NG, C, PB	I, M5, T1, T2, T3
23	<i>M. laticornis</i> (Jurine, 1820)	L	<1800	Tb, UP	NG, C	T1, T3
24	<i>Streblocerus serricaudatus</i> (Fischer, 1849) Fam. Chydoridae	L, SL, Sw	1500– 1800	UT	C	M4, Wo
25	<i>Acroperus harpae</i> (Baird, 1834)	L, SL, Pu, Ri	<1900	Tb, Ts, UT, UP, St	NG, S, C, SB	I, KN1, KN2, KA, M1, M4, PG, Pa, PK, T1, T3, T4, Wi, Wo
26	<i>Alona affinis</i> (Leydig, 1860)	L, SL, Sw, Ri, St	<1800	Tb, Ts, UT, BC, UP, St	K, NG, S, C, PB, SB	G2, KN1, KN2, KA, M1, M4, PG, T1, T2, T3, T4, Wo
27	<i>A. costata</i> (G.O. Sars, 1862)	L, Ri	<1500	Tb, UT, UP, St	NG, S, PB, SB	I, KN2, PG, T3
28	<i>A. guttata</i> (G.O. Sars, 1862)	L, SL, Ri	<1700	Tb, UT, UP, Si	NG, S, C, PB	I, M5, PG, T1, T2, T3, T4, Wo
29	<i>A. quadrangularis</i> (O.F. Müller, 1776)	L, SL, Sw, Po, Ri, St	<1900	U, Tb, Ts, UT, BC, UP, St	R, NG, S, C, SB	I, KN2, KN3, M1, M4, M5, PG, T2, T3, T4, Wi, Wo
30	<i>A. protzi</i> (Hartwig, 1900)	L	800	St	SB	M1
31	<i>Alonella excisa</i> (Fischer, 1854)	L, SL, Sw, Pu, Ri	<1900	Tb, UT, BC, Si, UP	NG, S, C, CM, PB	KN1, M2, M4, M5, PG, T1, T2, T3, T4, Tr, Wi, Wo
32	<i>A. nana</i> (Baird, 1843)	L, SL	<1800	Ts, UT	S	T4, M6
33	<i>Camptocercus rectirostris</i> (Schödler, 1862)	Ri	<600	Ts	K	G2
34	<i>Chydorus latus</i> (G.O. Sars, 1862)	L	1500– 1600	UT	S	T4
35	<i>C. sphaericus</i> (O.F. Müller, 1776)	L, SL, Sw, Pu, ORB, Po, Re, Ri, Sp	<2000	U, L, Ri, Tb, Ts, UT, BC, Si, UP, L, Sv, St	R, B, NG, K, S, C, CM, HM, PB, EG, SB	B, Ga, G1, G2, I, Kn, KN1, KN2, KN3, M1, M2, M4, M5, M6, P, PG, Pa, PK, T1, T2, T3, T4, V, Wi, Wo

36	<i>Coronatella rectangula</i> (G.O. Sars, 1861)	L, SL, Pu, Po, Re, Ri	<1900	Tb, Ts, UT, BC, WC, UP, BN, Tm	K, S, C, CM, L, PB, EG, SB,	B, G2, I, KN1, KN2, M3, M4, M5, PG, T1, T3, T4, V
37	<i>Disparalona rostrata</i> (Koch, 1841)	L, Re, Ri	<1000	Tb, UT, UP	K, PB, EG	B, KN1, KN2, PG
38	<i>Graptoleberis testudinaria</i> (Fischer, 1851)	L, Po, St	<800	Tb, UP, BC	NG, PB	KN2, M5, T3
39	<i>Leydigia leydigi</i> (Schödler, 1863)	Re, Ri	<800	Tb, UT, UP	K, S, PB	B, KN1, PG
40	<i>Peracantha truncata</i> (O.F. Müller, 1785)	L, SL, Sw, Ri, St	<1800	U, Tb, Ts, UT, UP, St	R, NG, K, S, C, SB	G2, KN1, M1, M2, M4, M6, PG, T1, T2, T3, T4, Wo
41	<i>Pleuroxus aduncus</i> (Jurine, 1820)	L, SL, Ri	<1800	UT, UP	C	M4, PG, Wi
42	<i>P. uncinatus</i> (Baird, 1850)	Ri	<800	UP	PB	PG
43	<i>Pseudochydorus globosus</i> (Baird, 1843)	Ri	<800	UP	PB	PG
44	<i>Oxyurella tenuicaudis</i> (G.O. Sars, 1862)	Po, Ri	<800	BC, UP	PB	M5, PG
45	<i>Tretocephala ambigua</i> (Lilljeborg, 1901) Fam. Sididae	Re, Ri	<800	Tb, UT, UP	K, S, PB	B, KN1, PG
46	<i>Diaphanosoma brachyurum</i> (Liévin, 1848)	Ri	<800	UP	PB	PG
47	<i>Sida crystallina</i> (O.F. Müller, 1776) Fam. Polyphemidae	L, Ri	<1000	Tb, UT, Si, UP	NG, PB	I, KN1, T3, PG
48	<i>Polyphemus pediculus</i> (Linnaeus, 1761) Fam. Diaptomidae	Ri	<800	UP	PB	PG
49	<i>Acanthodiaptomus denticornis</i> (Wierzejski, 1887)	L, Ri	<1800	Tb, UT, UP	NG, C	KN1, M4, PG, T1, T3, Wi
50	<i>Arctodiaptomus bacillifer</i> (Koelbel, 1885)	L, SL	1500– 1800	Ts, UT	S	T4, M6
51	<i>Eudiaptomus gracilis</i> (G.O. Sars, 1863)	L, SL, Re, Ri	<1000	Tb, UT, BC, UP	NG, S, C, CM, PB	KN1, PK, PG, Wi
52	<i>E. transylvanicus</i> (Daday, 1890)	L, SL, Po, Re	<1800	Tb, UT, BC, WC, UP	NG, S, K, C, L, PB	B, Kn, M3, M4, M5, M6, T2, V
53	<i>E. vulgaris</i> (Schmeil, 1898)	L, SL, Ri	<1800	Tb, Ts, UP	NG, S, PB, EG	T3, T4, PG

54	<i>Mixodiaptomus tatricus</i> (Wierzejski, 1883)	L, SL, Sw, Pu	900–1900	Ts, UT, BC, WC	S, C, CM, HM, L	M3, M4, M5, M6, T2, T4, Wi
55	<i>Sinodiaptomus sarsi</i> (Rylov, 1923) Fam. Temoridae	Pu, Po	400–500	U	R	M6
56	<i>Eurytemora velox</i> (Lilljeborg, 1853) Fam. Cyclopidae	Po, Ri	<500	Tm	SB	S
57	<i>Acanthocyclops americanus</i> (Marsh, 1893)	Sw, Pu, ORB, Ri, St, W, M, I, C	<700	Ri, Tb, Ts, BC, Si	NG, K, C, PB	G2, M4, M5, M6, Mo, PG, Tr
58	<i>A. kieferi</i> (Chappuis, 1925)	I, C	<600	Tb, Ts, UT	NG, K	KN1, Mo
59	<i>A. robustus</i> (G.O. Sars, 1863)	L, SL, Sw, Pu, Ri	<1700	Ri, Ts, UT, Sv	NG, K, S, EG	M6, Mo, Pa, PK, T4
60	<i>A. vernalis</i> (Fischer, 1853)	L, SL, Sw, Pu, ORB, Po, Re, Ri, St, W, M	<1900	Ri, Tb, Ts, UT, BC, WC, UP, St, Tm	K, S, C, CM, HM, L, PB, EG, SB	G2, Kn, KN2, M1, M2, M3, M4, M5, M6, Mo, PG, T2, V
61	<i>A. venustus</i> (Norman et Scott, 1906)	Sp	400–500	U	R	M6
62	<i>Cyclops strenuus</i> (Fischer, 1851)	L, Sw, Pu, Ri	<1600	U, Tb, Ts, UT, UP	R, S, K, PB, EG	G1, G2, Mo, M6, PG, Pa, PK, T4
63	<i>C. vicinus</i> (Ulyanin, 1875)	Sw, Pu, Re, Ri	<1000	Tb, Ts, UT, UP	NG, K, S, PB, EG	B, G1, G2, KN1, Mo, PG, Pa, PK, T3
64	<i>Diacyclops bicuspidatus</i> (Claus, 1857)	Sw, Pu, ORB, Po, Ri, St, W	<1600	U, Ri, Tb, UT, BC, UP	R, K, S, C, PB, EG	KN1, M4, M5, M6, Mo, PG
65	<i>D. bisetosus</i> (Rehberg, 1880)	Sw, Pu, Po, Ri, St, M, I	<1400	U, UP	R, C, PB, EG	M4, M6, Mo, PG
66	<i>D. clandestinus</i> (Yetman, 1964)	Sw, Pu, St, M, I, C	<700	Tb, Ts, UT	NG, K, S	KA, Mo
67	<i>D. cohabitatus</i> Monchenko, 1980	W, I	<1000	UP	PB, EG	Mo, PG
68	<i>D. crassicaudis</i> (G.O. Sars, 1863)	Ri, St, M	<1000	Ri, UP	K, NG, PB, EG	M6, Mo, PG
69	<i>D. hypnicola</i> (Gurney 1927)	I	-	-	-	Mo
70	<i>D. languidoides</i> (Lilljeborg 1901)	Sw, Pu, Ri, St, W, Sp, M, I	<1500	U, Tb, UP, BN	R, S, K, PB, EG	KN2, KA, M6, Mo, PG

71	<i>D. languidus</i> (G.O. Sars, 1863)	St, Sp, I	<1000	Tb, UP	NG, S	KN2, Mo
72	<i>D. odessanus</i> (Shmankevich, 1875)	Ri, W	<1000	UT	S	KN2, Mo
73	<i>Ectocyclops affinis</i> (G.O. Sars, 1863)	L	900–1000	WC	L	M3
74	<i>E. phaleratus</i> (Koch, 1838)	L, Sw, Pu, Po, St, M	<1000	BC, St	C, PB, SB	KN2, KA, M4, M5, Mo
75	<i>Eucyclops macruroides</i> (Lilljeborg, 1901)	L, Sw, Pu, Po, Re, Ri, St, M	<1000	Tb, UT, WC	NG, K, S, HM	B, KN1, M3, Mo, PG, T3
76	<i>E. macrurus</i> (G.O.Sars, 1863)	L, Sw, Pu, Po, Re, Ri	<1000	Tb, UT, UP	NG, K, S, C	B, KN1, M4, Mo, PG, T3
77	<i>E. serrulatus</i> (Fischer, 1851)	L, SL, Sw, Pu, ORB, Po, Re, Ri, St, W, Sp, M, I	<1900	U, Ri, Tb, Ts, UT, BC, WC, UP, Si, Sv, St	R, NG, K, S, C, CM, HM, L, PB, EG, SB	B, G2, KN1, KN2, M1, M2, M3, M4, M5, M6, Mo, PG, T1, T2, T3, T4, Wi
78	<i>E. speratus</i> (Lilljeborg, 1901)	St	<1000	BN	NG	KN2
79	<i>E. subterraneus</i> (Graeter 1907)	W, Sp	400–1800	U, UT, St	R, S, SB	M6
80	<i>Graeteriella unisetigera</i> (Graeter 1908)	Po, St, W	600–900	BC, St	PB, SB	M5, M6
81	<i>Macrocyclus albidus</i> (Jurine, 1820)	L, SL, ORB, Po, Re, Ri, St, M	<1000	Tb, Ts, UT, BC, WC, UP	NG, K, S, C, L, PB, EG	B, G2, KN1, M3, M4, M5, Mo, PG, Pa, PK, T1, T3
82	<i>M. distinctus</i> (Richard, 1887)	L, SL, Pu, ORB, Po	<1700	U, Tb, UT, BC, St	R, NG, C, PB, SB	M1, M4, M5, M6, T3
83	<i>M. fuscus</i> (Jurine, 1820)	L, SL, Sw, Pu, ORB, Po, Ri	<1000	U, Tb, BC, WC, UP, St	R, NG, C, HM, L, PB, EG, SB	KN2, M1, M3, M4, M5, M6, Mo, PG, T3
84	<i>Megacyclops gigas</i> (Claus, 1857)	SL, Sw, Pu, Ri	<1000	UT, BC	S, C	KN1, M4, M5, Mo, PG
85	<i>M. latipes</i> (Lowndes, 1927)	Sw, Pu	-	-	-	Mo
86	<i>M. viridis</i> (Jurine, 1820)	L, SL, Sw, Pu, ORB, Ri, St, W, Sp, M	<1300	U, B, Ri, UT, BC, WC, UP, St	R, B, NG, S, C, HM, PB, EG, SB	G1, KN2, KA, M1, M3, M4, M5, M6, Mo, PG
87	<i>Mesocyclops leuckarti</i> (Claus, 1857)	Sw, Pu, Po, Re, Ri	<1000	U, Tb, Ts, UP	R, K, PB, EG	G2, M6, Mo, P, PG, V
88	<i>Metacyclops gracilis</i> (Lilljeborg, 1853)	Ri	<1000	UT	S	KN1, Pa, PK
89	<i>M. minutus</i> (Claus, 1863)	L, Sw, Pu, I	<900	BC, St	C, SB	KN2, M4, M5, Mo

90	<i>Microcyclops bicolor</i> (G.O. Sars, 1863)	L, Sw, Pu, Ri	<800	Si, St	PB, SB	KN2, KA, Mo, PG
91	<i>M. rubellus</i> (Lilljeborg, 1901)	Sw, Pu, Ri, St, M, I	<800	L	EG	KN2, Mo
92	<i>M. varicans</i> (G.O. Sars, 1863)	Ri, St, Sp, M, I	<1000	Ri, Ts	B, K, NG	KN2, M6, Mo
93	<i>Paracyclops fimbriatus</i> (Fischer, 1853)	L, SL, Sw, Pu, ORB, Po, Re, Ri, St, W, Sp, M, I	<1800	U, B, R, Tb, Ts, UT, BC, WC, Si, UP, L, St	R, B, NG, K, S, C, CM, HM, L, PB, SB	B, G2, KN1, KN2, KN3, KA, M1, M3, M4, M5, M6, Mo, PG, T1, T3, T4, Tr
94	<i>P. poppei</i> (Rehberg, 1880)	Ri, St	<900	Ts, UP, L	K, NG, EG	KN2
95	<i>Tropocyclops prasinus</i> (Fischer, 1860)	ORB	900–1000	BC	C	M4
96	<i>Thermocyclops crassus</i> (Fischer, 1853)	Sw, Pu, Ri	<700	Si	PB	Mo, PG
97	<i>T. dybowskii</i> (Landé, 1890)	Ri	<1000	UP	PB, EG	PG
98	<i>T. oithonoides</i> (G.O. Sars, 1863)	Po	<800	R	NG	Ga

## Note:

Water bodies: lakes – L, small lakes – SL, swamps – Sw, puddles – Pu, old river beds – ORB, ponds – Po, reservoirs – Re, rivers – Ri, streams – St, wells – W, springs – Sp, moss – M, interstitial – I, caves – C.

River basins: Uzh – U, Latorytsia – L, Borzhava – B, Rika – R, Tereblia – Tb, Teresva – Ts, upper Tisza – UT, Black Cheremosh – BC, White Cheremosh – WC, Siret – Si, upper Prut – UP, Bystrytsia Nadvirnyanska – BN, Limnytsia – L, Svicha – Sv, Stryi – St, Tysmenytsia – Tm

Mountain massifs: Rivna – R, Borzhava – B, Near-Watershed Gorgany – NG, Krasna – K, Svydivets – S, Chornohora – C, Chyvchynsky Mountains – CM, Hryniavsky Mountains – HM, Losova – L, Pokutsko-Bukovynsky Carpathians – PB, External Gorgany – EG, Skole Beskids – SB

Authors: B – Bilak 1959; Ga – Galasun et al. 1970; G1 – Guleikova 2009; G2 – Guleikova 2010; I – Ivanets 2002; Kn – Konenko et al. 1965; KN1 – Kovalchuk N. 1999; KN2 – Kovalchuk N. 2006; KN3 – Kovalchuk N. et al. 2010; KA – Kovalchuk A. et al. 2006; Mo – Monchenko 2003; M1 – Mykitchak 2004; M2 – Mykitchak and Reshetylo – 2009; M3 – Mykitchak 2012; M4 – Mykitchak et al. 2014; M5 – Mykitchak 2014; M6 – Mykitchak unpublished; Pa – Parchuk 1995; PK – Parchuk and Kuch 1993; Pi – Pidgajko 1984; PG – Polischuk and Garasevitch 1986; S – Samchyshyna 2011; T1 – Terek 1983; T2 – Terek 1993; T3 – Terek 1999; T4 – Terek et al. 2004; Tr – Travyanko et al. 1980; V – Vlasova 1969; Wi – Wiśniowski 1888; Wo – Wolski 1935.