Macroinvertebrates (Full Report)

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ABSTRACT

Benthic macroinvertebrates were sampled by national experts during the JDS4 campaign in the first weeks of July with five different sampling approaches. Samples from Multi-Habitat Sampling (MHS) were completely analysed and used for Indicative Status Assessment (ISA). National experts with help of external experts processed and identified MHS samples according to JDS4 MZB Methodology. In the majority of cases, only one side of the river was selected for sampling, though at transboundary sites, both sides were usually sampled. In total, 484 taxa were found belonging to 19 higher taxonomical groups, 394 taxa were found in the Danube River and 287 taxa in tributaries. For definition of water quality, the Saprobic index and Slovak Multi-metric Index were used for indication of responds of macroinvertebrates assemblage to both effects of pollution and changes in hydromorphology. A brief discussion is given about the sampling efficiency of additional sampling methods concerning the successful detection of Unionidae mussels and Decapoda species.

1 INTRODUCTION

Benthic macroinvertebrates are the most widely used indicator group for lotic systems (Moog et al., 2018). These organisms, when used in such investigations, offer several benefits including easy identification at high taxonomic levels by non-specialists, high sensitivity of a great number of species to environmental stress, a wide distribution in various freshwater habitats and a relatively sedentary behaviour and short life cycle, in comparison to fish, which facilitate the detection of changes over time (Johnson et al. 1993).

The following subchapters describe the methods applied; the characteristics of the macroinvertebrate community along the Danube River and its tributaries and show resulting ISA and Saprobic index compared with previous JDS2 (2007), JDS3 (2013) and national assessment results.

2 METHODS

2.1 Sampling Methods

The JDS4 monitoring campaign for benthic macroinvertebrates was carried out by national teams while the Core team of international experts had a coordinating and advisory role to ensure the coherence between the approaches used by the national experts.

Based on the experiences from the previous Joint Danube Surveys, five different approaches were applied:

2.1.1 Main approach:

Multi-Habitat-Sampling (MHS) – used as a standardized WFD sampling method for the ecological status assessment (AQEM Consortium, 2002) was effective for ecological status assessment of wadable rivers – or large rivers at lower water period (Graf et al. 2015).

Method is described in details in JDS4 MZB Methodologyfor BQE Aquatic Macroinvertebrates (ver. 6.5). Benthic macroinvertebrate samples for taxonomical identification were collected using a hand-net from all available microhabitats by kicking or disturbing the substrate. Together 20 sampling units (replicates) were taken from all major microhabitats with coverage above 5%. In case of interesting or important microhabitats (e. g. Xylal) with coverage less than 5%, one additional replicate was taken (so-called sample 21st). Results of Multi-Habitat-Sampling were used for ISA and taxa richness overview.

2.1.2 Additional approaches:

Kick and sweep (**K&S**) – was proposed in order to provide additional data on biodiversity (specifically related to molluscs), as well as to provide full comparability with previous surveys and input to activity related to invasive species.

Deep-Water Dredging (DWD) – sampling in deep water regions using motor boats and dredges was used particularly to collect bottom material and taxa occupying the deep-water habitats. The procedure enables the more effective data collecting in the non-wadeable part of the river that actually covers majority of the river bed at any given cross section (mostly relevant for the lower Danube River).

Additional effort for Mussel Sampling (AMS) – an additional method was used for collecting reliable information on Unionidae mussel species relevant for collection of IAS data, and mussel specimens for PAHs analyses.

Specific sampling for crayfish (LiNi) – an additional method for collection of reliable information on this important component – comparable data almost completely missing. A combination of sampling methods on the Hungarian Danube, including **elecdtrofishing** and **hand search** was experimentally performed for providing more confident information on Invasive Alien Species (IAS), as well.

Methods are described in detail in full report and Standard Operational Procedures (SOP) for MZB and Invasive Alien Species (available on <u>www.danubesurvey.org/jds4</u>).

Total number of 46 JDS4 sampling sites were planned for macroinvertebrates sampling. Due to high water levels, sampling was postponed (to end of September) in case of River Inn at Passau-Ingling (JDS4-5-L) below power station. Sampling site Timok mouth (JDS4-42; 0.2 r. km) was sampled but no living organisms were found. From all five sampling approaches, only MHS was used for the diversity overview and ISA, samples from other approaches were processed partially and used for neozoa and molluscs study. Out of 45 JDS4 sites, 35 sites were sampled at one river side/bank and 10 at both sides/banks (explained in paragraph 2.2). Hence, 55 samples were totally collected.

For ensuring data comparability, external experts for selected MZB groups (Tab. 1) were involved. List of experts was approved by the ICPDR: Igor Kokavec (Oligochaeta), Dubravka Čerba, Nataša Popović, Djuradj Milošević (Chironomidae, Diptera), Béla Csányi (Mollusca), Jelena Đuknić (Simuliidae, Diptera), Stefan Anđus (Porifera) and Péter Borza (Crustacea).

Table 1. Problematic groups from MHS samples/country which have been identified by external experts (marked "•")

Така		Country												
IdXd	DE	AT	CZ	SK	HU	HR	RS	SI	BA	ME	RO	BG	MD	UA
Oligochaeta	•				•	•		•						
Chironomidae (Diptera)	•				•	•								
Mollusca	•			•		•	•	•						
Simuliidae (Diptera)			•			•								
Crustacea					•		•							

2.2 Metrics and Indicative Status Assessment (ISA) Method

Only one river side was selected for sampling. In case of transboundary sites, both river sides were usually sampled. Sampling sides have been agreed based on bilateral negotiations. Each side (left or right bank) was considered and assessed as a separate sample.

2.2.1 Multi-metric Index (MMI)

Slovak national method for large rivers (Makovinská et al. 2015) was used for the ISA and already tested with prior Austrian Danube data providing reasonably results (Leitner, 2013). Relevant metrics were selected for rivers in altitude below 200 m a.s.l. and between 200 - 500 m a.s.l. (Tab. 2). Internal Water Research Institute software INFOSYS based on ASTERICS ver. 4.0.4 was used for calculation of metrics and Indicative status final evaluation. List of taxa with quantitative values (density per 1.25 m2) represent the basic data for the calculation of the metrics. After transforming the values of the metrics to EQRs, their average value is calculated, which represents the resulting multimetric index. Based on value of this index (in the range 0 - 1) relevant Indicative status class was evaluated.

2.2.2 Saprobic indices (SI)

SI were calculated based on available national method, using ASTERICS 4.04 and EcoProf 5.0 software. National methods (DE, AT, SK) for calculation of the SI were used on JDS4 sampling sites 1 - 10, 13, 14, 19, 20, 21; on sites 11 and 12 – Slovak SI and on sites 34, 35, 36 Croatian HR-SI were applied. Romanian SI was applied for the other tributaries and sites which were located at Middle and Lower Danube River reach.

For the indication of quality classes, threshold values given in Tab. 3 were applied (Bujis, 2006). For Upper Danube River reach and tributaries (sites 1-8), national classification was used. In Germany the reference value is 1.85 for national type 10 (Rolaufs et al. 2003). In Austria the reference conditions are defined as 1.75 for ecoregion 9 and 2.0 for ecoregion 11 (changing between sites 8 and 10) (Stubauer

&Moog, 2003). Value 2.0 was used as the saprobic basic conditions for the middle and lower Danube River and its tributaries.

				M	etrics			
Large rivers at altitudes (m)	Saprobic index (Zelinka &Marvan)	(%) Oligosaprobic classified taxa (scored taxa = 100%)	BMWP	Rhitron Type Index (Biss et al., 2002)	Index of biocoenotic regions (IBCR)	(%) preferences for akal+lithal+psammal (scored taxa = 100%)	(%) Metarithral classified taxa (scored taxa = 100%)	EPT (number of taxa)
< 200	•	•	•	•	•	•		
200 - 500	•	•	•	•	•	•	•	•

Table 2. Metrics used in Slovak national assessment method

Table 3. Range of Saprobic Index

	Saprobic reference condition											
Status class	Germany national type 10	Austria Saprobic basic condition 1.75	Austria Saprobic basic condition 2.0									
I- High	1.75 - 1.85	≤ 1.75	≤ 2.00									
II - Good	1.86 - 2.30	1.76 - 2.21	2.01 - 2.40									
III - Moderate	2.31 - 2.90	2.22 - 2.68	2.41 - 2.80									
IV - Poor	2.91 - 3.45	2.69 - 3.14	2.81 - 3.20									
V - Bad	> 3.45	> 3.14	> 3.20									

2.2.3 Statistical Method

Ordination and classification methods were used to gain insight into variability of invertebrate communities along the Danube River. Principal coordinate analysis (PCoA) using matrix of Hellinger distances was employed to extract main compositional gradients. Longitudinal zones across which the invertebrate communities changed markedly were identified using stratigraphically constrained incremental sum of squares cluster analysis (CONISS, Grimm, 1987). Broken-stick model was used to determine significant number of zones in the cluster analysis (Bennett, 1996). For the multivariate analyses, data from left and right bank of the river were pooled within sites (Fig. 1).

We performed PCoA on a whole data set and also separately for six major taxonomic groups with more than 15 species recorded (Oligochaeta, Mollusca, Crustacea, Ephemeroptera, Diptera, Trichoptera). This allowed us to compare overall zonation with zonation patterns revealed by individual groups. Beside the qualitative comparison, we performed Procrustes analysis to quantify how well composition gradients of individual taxonomic groups match with overall community composition. The analysis was corroborated by randomization test based on 9,999 permutations (Peres-Neto & Jackson, 2001) (Tab. 4).

PCoA was also used to visualize differences in community composition between communities sampled at left and right banks. Only the sampling sites with both banks sampled were used in this analysis.

	All	Mollusca	Diptera	Crustacea	Ephemeroptera	Trichoptera	Oligochaeta
All	-	0,001	0,001	0,006	0,045	0,391	0,001
Mollusca	0,63	-	0,065	0,247	0,003	0,255	0,016
Diptera	0,72	0,34	-	0,080	0,112	0,012	0,001
Crustacea	0,47	0,27	0,35	-	0,080	0,102	0,007
Ephemeroptera	0,38	0,47	0,32	0,33	-	0,580	0,030
Trichoptera	0,39	0,27	0,43	0,33	0,20	-	0,006
Oligochaeta	0,77	0,42	0,65	0,48	0,38	0,42	-

Table 4. Correlations of differences in the composition of the whole assemblage (All) and individual groups. Statistically significant correlations highlighted in bold.

3 RESULTS and DISCUSSION

3.1 Diversity and density from Multi Habitat Sampling (MHS)

During the JDS4 sampling campaign, in total, 484 aquatic macroinvertebrate taxa were found in 55 samples (Annex 1). Altogether 394 taxa were found in the Danube River and 287 taxa in tributaries (Inn, Dyje, Morava, Moson Danube, Vah, Hron, Ipel, Ráckevei, Drava, Tizsa, Sava, Velika Morava and Prut).

The most diverse groups were Diptera (160 taxa) and Oligochaeta (53), followed by Trichoptera (42) and Gastropoda (41) then Crustacea (32), Ephemeroptera (30), Bivalvia (28), Coleoptera (25) and Odonata (22). Heteroptera (12), Hirudinea (9) and Turbellaria (5) are less heterogeneous groups. Other groups were even less diverse. Nematodes well identified at species level (11 taxa) only by Bulgarian national experts and were excluded from diversity and statistical analyses as they are not considered as a typical benthic macroinvertebrates (often categorized as microinvertebrates) and also for comparison purpose.

Focusing only at the Danube River reaches (Upper Danube River: from source to rkm 1790, Middle Danube River: from rkm 1790 – 943, Lower Danube River from rkm 943 to mouth; Tab. 7), most diverse groups are as follows: Diptera (130 taxa), Oligochaeta (40), Trichoptera (37), Mollusca (Gastropoda 36 taxa, Bivalvia 23 taxa), Crustacea (29), Ephemeroptera (23), Coleoptera (20) and Odonata (13). Along the Danube River reaches, EPT (Ephemeroptera, Plecoptera & Trichoptera), Coleoptera and Bivalvia taxa are decreasing in diversity. On the contrary, Oligochaeta together with Gastropoda were increasing in heterogeneity (Fig. 2).

Other groups are constant. Less than 10 taxa were recorded on sampling sites 29-L and 41-R and less than 6 taxa were examined on sites 23-L and 28-R in total. Cluster analysis of Danube River samples shows MZB assemblage changes in longitudinal gradient (Fig. 1).





As the slope of the river determines the flow velocity, the bed material and benthic communities gradually change. Analysis indicates 3 separate sections (Fig. 1), and the boundary between upper and middle section (16-R Medved'ov / 18-R Gönyű) is similar to the pre-defined upper and middle Danube River boundary where the first decrease of bed slope occurs. This is identical with the boundary between Danubian and Pontocaspian fauna (Brtek, 1953). However, the analysis shows that the boundary between the middle and lower section has shifted upstream in comparison to the generally accepted middle/lower Danube reach situated after the Iron Gate I. According to the multivariate analysis of JDS2 macroinvertebrate dataset a similar result was found: the Middle Section of the Danube river ends up in Hungary between Paks (site 27, 1532 rkm) and Baja (site 28, 1480 rkm) (Csányi, in verb). The explanation is given by the change in substrate composition due to another characteristic decrease of the bed slope: gravel is evidently changed to to smaller fraction (sand) that is illustrated well by the composition of aquatic biota. According to the JDS4 results only the Slovakian-Hungarian and the Hungarian Danube represents the Middle Section Type.

Differences in invertebrate community composition between left and right banks of the river were sometimes as large as differences among the sampling sites (Fig. 3, right). The variation within sites could be attributable to different habitat composition and/or to influence of tributaries. When compared to the results from JDS3, a similar diversity pattern occurred, however, the number of taxa of Gastropoda groups found during JDS4 has doubled. On the other hand, several Ponto-Caspian species native to the lower Danube River stretch found during JDS3 were now seen to be missing. In addition, species from genus *Pisidium* sp. are completely missing in the taxalists from the middle and lower reaches.



Figure 2. Number of taxa per taxagroup in upper, middle and lower reach of the Danube River and its tributaries.

In terms of total density (number of ind./1.25 m2), groups Crustacea and Gastropoda followed by Oligochaeta and Diptera (mostly Chironomidae) (Fig. 3, left) are the most dominant part of the benthic macroinvertebrates assemblage.

Along the Danube River longitudinal profile, density of Coleoptera, Ephemeroptera, Trichoptera, Gastropoda and Polychaeta is decreasing. Large rivers are one of the freshwater ecosystems most affected by hydrologic alternation, bank modification, pollution and navigation. EPT taxa in particular, are highly sensitive. However, in the case of JDS4, diversity of these particular taxa could be affected also by the sampling season (late summer). Some National experts noticed a higher water level before and during the sampling campaign.

This could affect the density and diversity of the benthic macroinvertebrates assemblage as flood flow was referred to decrease of Annelida, Ephemeroptera, Trichoptera, Coleoptera and Plecoptera groups in general (McMullen & Lytle, 2012).

Polychaeta represented only by *Hypania invalida* occurred mostly in the upper reach. On the contrary, Heteroptera increased in density from the upper to lower Danube River. Taxa of Gastropoda and Oligochaeta that suits flat banks with sandy and muddy sediments show a peak in the middle reach. Crustacean *Chelicorophium chelicorne* was not found during JDS1/2/3 campaigns, and it is surprising that it had been present in such high numbers during JDS4 as reported in 50-R and 51-R sites.

The rare species, *Theodoxus transversalis* was reported only at site 48 (Chiciu/Silistra, rkm 375) on the Lower Danube probably due to the high water level. It was detected at several Lower Danubian sites during previous surveys (JDS2 and JDS3) but additional methods (K&S and particularly deep-water dredging was necessary for the successful detection of this characteristic Danubian snail species..



Figure 3. In left: Density per taxagroup (ind./1.25 m²) in upper, middle and lower reach of the Danube River and in tributaries (only most abundant groups); Right: PCoA ordination plot showing differences in community composition between left and right sides (banks) of the same sampling sites. Variance explained by the ordination axes is given in parentheses.

A new Hydrobiid snail species was found in the Hungarian-Slovakian section: *Clathrocaspia knipowitschii* was detected at first during the JDS3. The sail was present along the whole cross section of the Danube at downstream Iron Gate I in deep-water dredged samples and one specimen was found in Kozlodui, as well. During JDS4 the presence of this species was proven at Gönyű and eDNA method detected it in Medve/Medvedov, too. The example of these two snail species illustrate well that the study of deep-water habitats using appropriate sampling procedure is important also.

In tributaries, Gastropoda is the most dominant group, followed by Diptera and Oligochaeta group. Compared to the Danube River reaches, Diptera represent principal part of the community, represented mainly by the family Chironomidae.

3.2 The method for Unionidae species

Unionidae species are characteristic members of the Danube River. Usually, it is very difficult to find individuals along the river due to the seldomly distributed mussel habitats. Hence a method using **additional effort** was necessary to apply for discovering these animals along the river bed and to determine the size of their population.

The meaning of additional efforts is to collect mussels in field using the so called "full body contact" method: going directly in the water looking for those habitats that we think mussels should be there and touching the bottom carefully by hand, searching the bottom for mussel individuals. The whole procedure consists of two phases:

- 1. Visual identification of suitable habitats at the sampling sites;
- 2. Searching for mussels at the sites by tactile sensing of them.

Based on the experiences of the Cousteau-Expedition (1991-92) conducted along the entire length of the Danube River it is clear that these habitats are "quasi-stationary" locations where the river bottom provides appropriate living and existence conditions for mussels on a long-time scale for their colonization. Our basic recognition concerning mussel occurrences in the Middle Danube is that

Unionids can usually colonize successfully the transition zones of lenitic and lotic habitats of river sections where the stability of bottom provides perfect survival conditions for mussels: neither extended bed erosion nor serious sedimentation occurs along this type of river section.

Discovering the appropriate location, it is necessary to go under the water by free lung diving and look for mussels directly by hand searching on the bottom. Therefore, the best season for such kind of "on-site" field observation is the summer period when warmer water temperature and low water conditions exist. Sufficient field experience allows the recognition of the shape of the shell and identification of mussel species under the water based on touching it (only seven Unionidae species live in the Danube).

3.3 Comparative analysis of four methods for exploring Unionidae mussel stocks

Across the whole investigated Danube River, Unionidae mussels were detected only at 10 sites where altogether 4 species and 64 individuals were found (Fig. 4). MHS and K&S method indicated that *Sinanodonta woodiana* is the dominant species on the entire Danube River. It is important to note that this finding is based on a very special dataset: 27 individuals of this non-indigenous species were found on the Danube (3 on the tributaries) and 20 of them was described from Bazias (left, Romanian side) in one AQEM sample. This value overweigth the general results of Unionidae collected by MHS.



Figure 4. Species composition and abundance of detected Unionidae stock by different sampling procedures along the Danube River during JDS4. Note that MHS and KAS refer to the entire Danube whereas DWD and AMS was done only on the HU-RS section (Total ind. number = total caught animals per method).

Beside of MHS and K&S the Deep-Water Dredging (DWD) and the Additional Effort for Mussel Sampling (AMS) was performed on the **Hungarian and Serbian Danube section**, on the 942 river km long stretch at 17 sampling sites. The AMS method provided much higher numbers of collected individuals than any of the other three methods. There is no doubt that neither MHS nor K&S could give realistic and reliable information about species composition and abundance. Altogether only six individuals of three species were found by MHS at three sampling sites of seventeen. K&S procedure proved the presence of four species and twelve individuals at five sites. DWD detected all of the registered five species but only at seven sites, altogether 35 individuals were detected in the samples. However, AMS resulted in an expressive value: 332 mussel individuals of five species were found at 13 sampling sites (Fig. 5).

The indication of species composition and abundance by different methods is interesting also. *Unio* crassus and Anodonta anatina were not found by MHS method. K&S indicated the overall dominance of Sinanodonta woodiana but only twelve individuals of Unionidae were detected by this method.

Relatively many of *Anodonta anatina* specimens were present in the dredged samples among 35 individuals. AEM sample showed finally the realistic species composition of the investigated Middle and part of the Lower Danube section (Fig. 5) showing the overall dominance of *Unio tumidus* detecting more than 300 specimens.



Figure 5. Results of four mussel sampling methods on the Hungarian-Serbian Danube during JDS4. Yellow: *Anodonta anatina*; red: *Sinanodonta woodiana*; green: *Unio crassus*; ligth blue: *U. pictorum*; dark blue: *U. tumidus*.

The example of JDS4 illustrates that the use of Additional Effort method was necessary to clarify the real abundance and species composition of the Unionidae mussels in the Middle Danube. There is another finding of the JDS4 program: it is very important to know the physiognomy and hydraulic character of the investigated river during such surveys in order to predict the suitable habitat pattern of the given river sections where mussel sampling is planned.

Two conclusions should be emphasized:

1. Effective detection of different organisms could vary on a wide scale, particularly in large and very large rivers due to the rare availability of appropriate habitats. New species-specific sampling approach could help to increase the detection effectiveness;

2. Particular attention is necessary for appropriate design of sampling locations in case of longitudinal surveys along large and very large rivers for reliable data collection. Bed stability plays central role in the successful colonization and survival of mussels. The best habitats can develop in transitional zones between lenitic and lotic sites. The transition could happen from upstream to downstream (flow velocity decreases parallel to the flow direction), or, from littoral to deep bed, forming a zone where the transition is perpendicular to the length of the river (flow velocity increases with depth).

3.4 Sampling of Decapoda species

Beside of the regular LiNi crayfish trap sampling two additional methods were applied on the Hungarian Danube section during two seasons, summer and autumn:

- Electrofishing (EF);
- Hand searching (HS).

The application of additional methods provided more reliable dataset concerning the detection of nonindigenous Decapoda species on this investigated Danube stretch (Tab. 6, Fig. 6). Although *Procambarus clarkii* was found only downstream of Budapest by LiNi (three specimens at summer and two at autumn), hand searching detected this new North American species at Paks, 120 km from Budapest downstream, as well. EF and HS were able to catch much more animals than LiNi: 61 individuals in summer and 77 in autumn. Altogether four Decapoda species were detected in the Hungarian Danube section, 242 in summer and 248 in autumn, respectively. Out of these numbers LiNi trap detected 17 of them in summer and 18 in autumn period indicated the necessity of using more sampling methods for Decapoda surveys. This conclusion is very similar to the outcome of the comparative mussel sampling program performed on the Hungarian-Serbian Danube section.

Table 5. Number of caught Decapoda species by three methods during JDS4 on the Hungarian Danube.

Summ	ner	-		
	LiNi	FF	нѕ	Individual number of species
Faxonius limosus	12	74	63	149
Pacifastacus leniusculus	1	6	9	16
Procambarus clarcii	3	19	42	64
Pontastacus leptodactylus	1	7	5	13
Summ of animals per method	17	106	119	242
Autur	nn			
Autur	nn			Individual number of
Autur	nn LiNi	EF	HS	Individual number of species
Autur Faxonius limosus	nn LiNi 9	EF 64	HS 60	Individual number of species 133
Autur Faxonius limosus Pacifastacus leniusculus	nn LiNi 9 3	EF 64	HS 60 9	Individual number of species 133 18
Autur Faxonius limosus Pacifastacus leniusculus Procambarus clarcii	nn LiNi 9 3 2	EF 64 31	HS 60 9 46	Individual number of species 133 18 79
Autur Faxonius limosus Pacifastacus leniusculus Procambarus clarcii Pontastacus leptodactylus	nn LiNi 9 3 2 4	EF 64 6 31 5	HS 60 9 46 9	Individual number of species 133 18 79 18





Summarizing the results of the two seasonal surveys using three different sampling methods a very comprehensive picture can be drawn about the present invasive situation on the Hungarian Danube. *Faxonius limosus* dominates the overall population (Fig. 7).



Figure 7. Relative abundance of Decapoda species in the Hungarian Danube section based on data of three sampling methods and two sampling periods.

Based on data of three sampling methods and two sampling periods at present the native *Pontastacus leptodactylus* population forms only 6.33% of the total abundance. This time more than the half of the total catch consists of *Faxonius limosus* and more than the quarter belongs to *Procambarus clarkii*.

3.4.1 Longitudinal distribution based on three methods

As it is proven during JDS4, non-indigenous species are very frequent elements nowadays in the Hungarian Danube section. It is interesting new information that *Procambarus clarkii* has extended distribution from Budapest downstream to Paks. Hand searching provided most of this species (72)

specimens downstream Budapest). *Faxonius limosus* is present in all investigated cross section being the most frequent invasive crayfish in the Hungarian Danube. The largest population size was experienced in the Ráckevei-Soroksári Danube arm (RSD). However, it seems that *Pacifastacus leniusculus* started to populate the upper Danube downstream because recent research detected its presence at several new sites around the Szigetköz area (Weiperth et al. 2020, personal communication).

To carry out such a detailed survey using several sampling methods is very much advisable in other Danubian countries in order to follow the spread of the new non-indigenous Decapoda species along the river. It is the good news for now that - according to the data of all methods - the native *Pontastacus leptodactilus* is still present at the investigated Upper and Lower Danube in Hungary, though in very low density.

3.5 Indicative Status Assessment (ISA) based on Multi-metric Index (MMI) and Saprobic Index (SI)

The saprobic system takes into account the varying sensitivity of the macrozoobenthos species to oxygen depletion in particular. Water quality class expressed by SI is derived from the individual saprobic values assigned to bioindicators occurring in assessed water environment.

Indicative status assessment (ISA) is assessment based on one sampling event only, and results are neither aimed to replace nor influence national assessment, but rather to serve to compare situations along the investigated stretch of the Danube river and its tributaries.

Along the Danube River reaches (36 samples in total), 24 samples (67%) can be classified into good status, 5 samples (14%) into high status, 4 samples (11%) to moderate and 3 samples (8%) fall into the poor status. Compared to the JDS3 and JDS2, results are similar, however Graf et al. (2015) note the differences between Airlift and MHS results. Besides that, at the banks the conditions can be different and can even vary between right and left bank, what can be seen at sites (37, 40, 41, 48) (Fig. 3, right).

In the case of samples from tributaries (19 samples), the situation is as follows: 13 (68%) samples can be classified into good status, 4 (21%) to moderate and 2 samples to poor status (Tab. 7). Results from the Danube River using MMI show good indicative class in 13 samples, moderate class in 11 samples and poor class in 10 samples (Tab. 7).

In two sites, high status was indicated: 2-R Bittenbrunn, where the highest diversity was documented and 29-L Hercegszanto/Batina/Bezdan, where surprisingly only 8 taxa were found (status based on BMWP index was 4) and therefore the overall indicative status for this site cannot be considered as fully reliable.

Table 6. **Indicative status assessment**: Saprobic index class (SI) and Slovak MMI status class (SK) for the Danube River sites with results from JDS2 (only Saprobic index class, Airlift sampling method) and JDS3 (MHS method) - Saprobic index class and Slovak MMI compared to **National assessment**: DE – national intercalibrated MZB assessment tool Perlodes; AT, SK, HU, HR, RO and BG – national methods applied on JDS4 data (* samples were note taken under the best possible conditions).

JDS4	JDS4				JDS2 JDS3			JDS4					National assesment				ont
					SI	SI	SK		S	51	S	K		Mat		issesiii	ent
site	rkm	River		Sampling site	Airlift	м	ня		Right	Left	Right	Left					
no.	. Kill				7.011110		115		side	side	side	side		Cla	ISS	Cou	ntry
					Class	Cla	ass		Cla	ass	Cla	ass					
1	2581	Danube		Böfinger Halde		11	2			Ш		2		2	2	D	E
2	2479	Danube		Bittenbrunn 700m below P. station					Ш		1			2	2	D	Æ
3	2417	Danube		Above Klösterl - Kelheim	Ш	- 11	2		Ш		3			3	3	D	Æ
4	2258	Danube	-6	Niederalteich - Mühlau		- 11	2		Ш		3			3	3	D	Æ
6	2204	Danube	ea	Jochenstein	- 111	- 111	4		Ш	Ш	4	4		2	1	A	Т
7	2113	Danube	5	Enghagen					Ш		4			3	3	A	Т
8	2008	Danube	dd	Oberloiben	Ш	11	3			Ш		4		3	3	A	Т
10	1878	Danube		Hainburg, upstream Morava	1	11	2		1		2			3	3	A	Т
14	1871	Danube		Bratislava	- 11	11	2		Ш		2			2	2	S	К
16	1806	Danube		Medveďov / Medve	Ш	11	2		Ш		3			3	3	S	К
18	1791	Danube		Gönyű		11	2		Ш		2			4	1	H	J*
22	1707	Danube		Szob	- 11	11	2		Ш		4			4	1	H	J*
23	1666	Danube		Budapest upstream - Megyeri bridge	П	11	3			- 11		4		4	1	H	J*
24	1632	Danube	_	Budapest downstream - M0 bridge	1	111	3			- I -		2		4	1	H	J*
26	1560	Danube	ac	Dunafoldvar	П	11	2		Ш		3			4	1	H	J*
27	1532	Danube	Re	Paks	П	11	2			- I -		3		3	3	H	J*
28	1480	Danube	dle	Baja	П	11	2		1		4			2	1	H	J*
29	1425	Danube	Mie	Hercegszanto / Batina / Bezdan	П				Ш	Ш	2	1		1		Н	R
31	1300	Danube		Ilok / Backa Palanka	П	11	3		Ш	- 11	3	3		4		H	۲*
37	1150	Danube		Downstream Pancevo	IV				IV	- 11	3	4					
40	1075	Danube		Banatska Palanka / Bazias	П	11	2		IV	- 111	4	2			1		RO
41	850	Danube		Upstream Timok (Rudujevac / Gruia)	Ш	11	3		Ш	Ш	4	2			1		RO
43	836	Danube	ach	Pristol / Novo Selo Harbour	- II	- II	2		Ш	Ш	2	2		2	1	BG	RO
47	488	Danube	B B	Downstream Ruse/Giurgiu (Marten)	- II	1	3		Ш	1	2	2		3	2	BG	RO
48	375	Danube	wer	Chiciu/Silistra	- 111 -	- 11	3		IV	Ш	3	3		3	2	BG	RO
50	132	Danube	Lov	Reni	Ш	11	3		Ш		3				2		RO
51	17	Danube		Vilkova - Chilia arm/Kilia arm	Ш	111	3		Ш		2				1		RO

From the tributaries, 8 samples fall in moderate class, 5 samples into poor class, 4 samples to good class and 2 samples achieved high class (Tab. 7). These results are not plausible and lead us to conclusion that the Slovak method should not be used for the ISA in tributaries, as seen especially in cases of Velika Morava and Sava Rivers, with high variance of classes within their longitudinal stretches (Tab. 7).

Table 7. **Indicative status assessment**: Saprobic index class (SI) and Slovak MMI status class (SK) for the Danube tributaries with results from JDS2 (only Saprobic index class - Airlift sampling method) compared to **National assessment**: CZ – intercalibrated MZB assessment; SK, HR, SI and RO - national methods applied on JDS4 data.

JDS4	JDS4		JDS2 JDS3 JDS4						National accormont						
				SI	SI	SK		SI	S	K		Mati		issesiii	lent
site	rkm	River	Sampling site	Airlift	MUS		Right	Left	Right	Left					
no.	INII			AIIIIIU	IVITIS	>	side	side	side	side		Class		Cou	ntry
				Class	Class	s	C	ass	Class						
5	4	Inn	Inn at Passau - Ingling below PS					- II		2					
11	17	Dyje	Pohansko					II	3	3		3		C	Z
12	79	Morava	Lanžhot					II		2		2		C	Z
13	1	Morava	Devín					III		4		4		S	K
17	2	Moson Danube	Vének	IV				Ш		3					
19	2.8	Vah	Komárno				III		3			3		SK	
20	1.7	Hron	Kamenica					II		2		2		S	K
21	12	Ipeľ	Salka					II	3	3		3		S	K
25	1	Ráckevei	Tass	Ш				Ш		3					
30	5	Drava	5 km upstream Danube confluence				П		2			2		H	IR
32	155	Tisza	Tiszasziget / Martonoš				IV		4						
33	1	Tisza	Tisza mouth					III		3					
34	729	Sava	Jesenice na Dolenjskem				I		1			2		5	SI
35	205	Sava	Jamena					Ш		3					
36	12	Sava	Sava mouth (rkm 7.0)				П		4						
38	154	Velika Morava	Varvarin				П		1						
39	0.5	Velika Morava	Velika Morava mouth				IV		4						
49	0.5	Prut	Giurgiulesti				П	Ш	3	4			1		RO

4 CONCLUSIONS

Change in substrate composition of the Danube River induce gradual benthic community shifts from rheophilous to potamophilous in longitudinal profile. Based on cluster analysis of MZB assemblage from the Danube River samples, three sections have been identified: upper/middle section between sampling sites 16 (Medved'ov, rkm 1806) and 18 (Gönyű, rkm 1791) and for middle/lower section with boundary between sites 28 (Baja, rkm 1480) and 29 (Batina, rkm 1425).

The saprobity of the Danube River and its tributaries varied between water quality class I, II, III and even IV. However, in some cases, number of bioindicators found was too small for valid interpretation or conclusions.

Despite the assessment approach being very similar, the indicative status shows generally worse conditions (roughly by one class) when compared to JDS3 results. This could be caused by different sampling methodology (sampling from one river bank was preferred) which reduced the number of sensitive taxa and, in some cases, the higher water level increased bed load movement and could affect benthic communities, leading the recolonization of habitats to take longer.

Slovak Multi-metric index seems not to be suitable for the tributaries' assessment. Hence, the large tributaries along the Danube River deserve their own particular approach. For the next JDS, assessment methods should be tested on JDS4 data from main channel and tributaries separately.

For ensuring best results, both river banks should be sampled. The application of different sampling methods always provide better data in several aspects, however from a practical point of view, national teams should focus only at one main sampling technique (e.g. MHS or DWS in the lover Danube River reach). Assistance of external experts with most problematic groups, e.g. Oligochaeta and Chironomidae (Diptera), could be recommended for each participating country. This will ensure data comparability (especially for statistical methods) of the most abundant groups.

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ANNEX 1. Taxalist from Danube River and its tributaries (MHS samples only)

Taxon namebe be be bebe be bebe be be be beTaxon namebe be be be be be be bebe be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be be		Danube						Danube		~	
PORIFERA Radix sp. Network Spongillidae Gen.sp. • Radix sp. • • NEMATODA Theodoxus danubialis • • • Dorylaimus sp. • Theodoxus danubialis • • Dorylaimus stagnalis • Theodoxus prevostianus • • Enoploides fluviatilis • • Theodoxus prevostianus • • Monchystera stagnalis • • Valvata dristata • • • Monchystera stagnalis • • Valvata dristata • • • • Paradorylaimus fillormis • • Viviparus sphaeridius • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Taxon name	Upper	Middle	Lower	Tributary	Taxon name	Upper	Middle	Lower	Tributary	
Spongillidae Gen.sp. • Radix sp. • • NEMATODA Theodoxus danubialis • • • • Dorylaimus stagnalis • Theodoxus fluviatilis • • • Dorylaimus stagnalis • Theodoxus palassi • • • Enoploides fluviatilis • • Theodoxus provensalaus • • Monchystera stagnalis • • Valvata cristata • • • Monchystera stagnalis • • Valvata cristata • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <t< td=""><td>PORIFERA</td><td></td><td></td><td></td><td></td><td>Radix balthica/labiata</td><td>•</td><td></td><td></td><td></td></t<>	PORIFERA					Radix balthica/labiata	•				
NEMATODA Theodoxus fluviatilis • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <th< td=""><td>Spongillidae Gen. sp.</td><td>•</td><td>•</td><td></td><td></td><td>Radix sp.</td><td>•</td><td>•</td><td></td><td></td></th<>	Spongillidae Gen. sp.	•	•			Radix sp.	•	•			
Dorylaimus sp. Image of the second seco	NEMATODA	•			•	Theodoxus danubialis		•	•	•	
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Enoploides fluviatilis Theodoxus prevostianus Theodoxus prevostianus Theodoxus transversalis Theodoxus tran	Dorylaimus stagnalis			•		Theodoxus palassi			•		
Inoploides sp. Image: Constraint of the cons	Enoploides fluviatilis			•		Theodoxus prevostianus			•		
Monchystera dispar • Theodoxus transversalis • • Monchystera stagnalis • Valvata cristata • • Monchystera stagnalis • Valvata piscinalis • • Nematoda Gen. sp. • • Viviparus spensous • • Rabditis sp. • • Viviparus sphaeridius • • Tobrilus gracilis • • Viviparus viviparus • • • Tobrilus gracilis • • Viviparus viviparus • • • • Nematomorpha Gen. sp. • • Corbicula sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Enoploides sp.			•		Theodoxus sp.	•	•	•	•	
Monchystera sp. • Valvata cristata • • Monchystera stagnalis • • Valvata piscinalis • • Nonchystera stagnalis • • Viviparus secrosus • • • Paradorylaimus filiformis • • Viviparus sphaeridius • • • Rabditis sp. • • Viviparus sphaeridius • • • • Tobrilus sp. • • BIVALVIA • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Monchystera dispar			•		Theodoxus transversalis			•	•	
Monchystera stagnalis••Valvata piscinalis••Nematoda Gen. sp.•••••Paradoryläuns Glifformis•••••Rabditis sp.••••••Tobrilus gracilis•••••••Tobrilus gracilis•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	Monchystera sp.			٠		Valvata cristata	•				
Nematoda Gen. sp. • • Viviparus sp. • • Paradonylaimus filiformis • • Viviparus sp. • • Rabditis sp. • • Viviparus sphaeridius • • Tobrilus gracilis • • • • • • • Tobrilus sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <t< td=""><td>Monchystera stagnalis</td><td></td><td></td><td>٠</td><td></td><td>Valvata piscinalis</td><td>•</td><td></td><td></td><td>•</td></t<>	Monchystera stagnalis			٠		Valvata piscinalis	•			•	
Paradorylaimus filiformis • Viviparus sp.haeridius • • Rabditis sp. • Viviparus syhpaeridius • • Tobrilus gracilis • Viviparus syhpaeridius • • Tobrilus sp. • • BIVALVIA • • NEMATOMORPHA Anodonta sp. • • • • Sordius sp. • • Anodonta sp. • • • Nematomorpha Gen. sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Nematoda Gen. sp.	•	•	•		Viviparus acerosus		•	•	•	
Rabditis sp. • Viviparus sphaeridius • Tobrilus gracilis • Viviparus viviparus • NEMATOMORPHA Anodonta anatina • Gordius sp. • Anodonta anatina • NEMATOMORPHA Anodonta anatina • • Gordius sp. • Anodonta anatina • • TURBELLARA Corbicula fluminea • • • Dugesia lugubris/polychroa • Dreissena bugensis • • Dugesia lugubris/polychroa • Preissena sp. • • • Ougesia polychroa • Preisdium amnicum • • • • Polycelis nigra/tenuis • Plisidium matustre • • • • Acroloxus lacustris • • Plisidium moltessierianum • • • Bithynia leachi leachi • • Plisidium subruncatum • • • • • • • • • • • • • • • •<	Paradorylaimus filiformis			•		Viviparus sp.		•	•		
Tobrilus gracilis • • • • • Tobrilus sp. • BIVALVIA MEMATOMORPHA Anodonta antina • • Gordius sp. • Anodonta antina • • Nematomorpha Gen. sp. • Anodonta antina • • • TURBELLARA Corbicula fluminea • • • • • Dugesia lugubris/polychroa • Dreissena polymorpha • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <	Rabditis sp.			•		Viviparus sphaeridius			•		
Tobrilus sp. Image: Sp.<	Tobrilus gracilis			•		Viviparus viviparus		•	•	•	
NEMATOMORPHA Anodonta anatina Image: Construct and the second secon	Tobrilus sp.			•		BIVALVIA					
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Nematomorpha Gen. sp. • Corbicula fluminea • • • TURBELLARA Corbicula sp. • • • • Dendroccelum lacteum • Dreissena polymorpha • • • • Dugesia lugubris/polychroa • Dreissena pugensis • • • • Dugesia tigrina • • Muscullum lacustre • • • • Polycelis nigra/tenuls • • Pisidium casertanum ssp. • • • • • Acroloxus lacustris • • Pisidium milum • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Gordius sp.			•		Anodonta sp.			•	•	
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Dendrocoelum lacteum • Dreissena polymorpha • • • Dugesia lugubris/polychroa • Dreissena bugensis • • Dugesia polychroa • Dreissena sp. • • • Dugesia tigrina • Musculium lacustre • • • • Polycelis nigra/tenuis • Pisidium annicum • • • • Acroloxus lacustris • • Pisidium milum • • • Acroloxus lacustris • • Pisidium moitessierianum • • • Bithynia leachii leachii • • Pisidium subruncatum • • • Borysthenia naticina • • • Pisidium subruncatum • • • Gaba truncatula • • • Pisidium subruncatum • • • • • • • • • • • • • • • • • • • • • • • <td>TURBELLARA</td> <td></td> <td></td> <td></td> <td></td> <td>Corbicula sp.</td> <td>•</td> <td></td> <td></td> <td></td>	TURBELLARA					Corbicula sp.	•				
Dugesia lugubris/polychroa•Dreissena bugensis•Dugesia polychroa•Dreissena sp.••Dugesia tigrina••Pisidium lacustre•Polycelis nigra/tenuis••Pisidium amnicum•GASTROPODAPisidium casertanum ssp.••Acroloxus lacustris••Pisidium amnicum•Acroloxus lacustris••Pisidium casertanum ssp.•Acroloxus lacustris••Pisidium moitessierianum•Bithynia leachii leachii••Pisidium sp.•Bithynia tentaculata••••Borysthenia naticina••••Esperiana accularis••••Esperiana accularis••••Galba truncatula••••Hippeutis complanatus••••Holandriana holandrii••••Lithoglyphus naticoides••••Physella acuta••••Physella acuta/heterostropha•••Physella acuta••••Physella acuta/heterostropha•••Physella acuta••••Physella acuta/heterostropha•••Physella acuta/heterostropha•••Physella sp.•••• </td <td>Dendrocoelum lacteum</td> <td>•</td> <td></td> <td></td> <td></td> <td>Dreissena polymorpha</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td>	Dendrocoelum lacteum	•				Dreissena polymorpha	•	•	•	•	
Dugesia polychroaImage: Constraint of the second secon	Dugesia lugubris/polychroa	•				Dreissena bugensis		•		1	
Dugesia tigrina••Musculum lacustre•Polycelis nigra/tenuis•Pisidium amnicum••GASTROPODAPisidium casertanum ssp.••Acroloxus lacustris••Pisidium mellum•Ancylus fluviatilis••Pisidium millum•Bithynia leachii••Pisidium millum••Bithynia tentaculata•••Pisidium nitum••Borysthenia naticina•••Pisidium sp.•••Caspia milae•••Pisidium spinum••••Esperiana accularis•••Pisidium subtruncatum•••••Gaba truncatula•••Pisidium subtruncatum••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	Dugesia polychroa				•	Dreissena sp.	•			•	
Objectis nigra/tenuis • Pisidium amnicum • • GASTROPODA Pisidium amnicum • • • Acroloxus lacustris • • Pisidium minum • • Ancylus fluviatilis • • Pisidium minum • • • Bithynia leachii • • Pisidium moitessierianum • • • Bithynia leachii • • Pisidium sp. • • • Borysthenia naticina • • Pisidium sp. • • • Caspia milae • • Pisidium subtruncatum • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <td>Dugesia tigrina</td> <td>•</td> <td></td> <td></td> <td>•</td> <td>Musculium lacustre</td> <td></td> <td></td> <td></td> <td>•</td>	Dugesia tigrina	•			•	Musculium lacustre				•	
GASTROPODA Pisidium casertanum ssp. • Acroloxus lacustris • • Pisidium henslowanum • Acroloxus lacustris • • Pisidium henslowanum • • Ancylus fluviatilis • • Pisidium milium • • • Bithynia tentaculata • • • Pisidium mitidum • • • Borysthenia naticina • • • Pisidium subtruncatum • • • Borysthenia acicularis • • • Pisidium subtruncatum • • • Esperiana esperi • • • Pisidium complanata • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <td< td=""><td>Polycelis nigra/tenuis</td><td>•</td><td></td><td></td><td></td><td>Pisidium amnicum</td><td>•</td><td></td><td></td><td>•</td></td<>	Polycelis nigra/tenuis	•				Pisidium amnicum	•			•	
Acroloxus lacustris••Pisidium henslowanum••Ancylus fluviatilis••Pisidium milium••Bithynia leachii leachii••Pisidium moitessierianum••Bithynia tentaculata•••Pisidium moitessierianum••Borysthenia naticina•••Pisidium sp.•••Caspia milae•••Pisidium subtruncatum••••Esperiana acicularis•••Pisidium supinum•••••Galba truncatula••••Pisidium supinum•••••Galba truncatula••••Pisidium corneum••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	GASTROPODA			1		Pisidium casertanum ssp.	•			1	
Ancylus fluviatilis•Pisidium milium•Bithynia leachii••Pisidium milium••Bithynia tentaculata•••Pisidium milium••Borysthenia naticina•••Pisidium suptruncatum•••Borysthenia naticina•••Pisidium suptruncatum••••Caspia milae•••Pisidium suptruncatum•••••Esperiana esperi••••Pseudanodonta complanata••••Galba truncatula••••Sphaerium corneum•••••Gyraulus albus•••Sphaerium ovale•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <td< td=""><td>Acroloxus lacustris</td><td></td><td></td><td>•</td><td>•</td><td>Pisidium henslowanum</td><td>•</td><td></td><td></td><td>•</td></td<>	Acroloxus lacustris			•	•	Pisidium henslowanum	•			•	
Bithynia leachiiPisidium moitessierianumBithynia leachii•Bithynia leachii•Bithynia tentaculata•Pisidium nitidum•Borysthenia naticina•Caspia milae•Caspia milae•Esperiana acicularis•••Bithynia eachii leachii•Pisidium subtruncatum•Esperiana acicularis•••Bithynia eachii leachii•Caspia milae•Speriana esperi•••Galba truncatula•Gyraulus albus•Ippeutis complanatus•Mippeutis complanatus•Hippeutis complanatus•Holandriana holandrii•Lithoglyphus naticoides•••Sphaerium rivicola•Unio pictorum•Microcolpia acicularis•••Physella acuta/heterostropha•Physella acuta/heterostropha•Physella acuta/heterostropha•Physella sp.•Planorbarius corneus•Planorbarius corneus•Potamopyrgus antipodarum•••Potamopyrgus antipodarum•••Patinophia carinatus•••Potamopyrgus antipodarum•••Patinophia complanata•••Potamopyr	Ancylus fluviatilis	•			•	Pisidium milium				•	
Bithynia tentaculata••Pisidium nitidum•••Borysthenia naticina••Pisidium sp.••••Caspia milae••Pisidium subtruncatum••••Esperiana acicularis•••Pisidium subtruncatum•••Esperiana esperi•••Pisidium supinum••••Galba truncatula••••Pseudanodonta complanata•••Gyraulus albus•••Sphaerium corneum•••••Hippeutis complanatus•••Sphaerium roicola••••Holandriana holandrii•••Sphaerium roicola•••••Lymnaea stagnalis•••Sphaerium sp.•••••Microcolpia acicularis•••Sphaerium sp.•••••Physal fontinalis••••Unio pictorum•••••Physella acuta••••••••••••••••••••••••••••••••••••••••••<	Bithynia leachii leachii				•	Pisidium moitessierianum				•	
Borysthenia naticina•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	Bithynia tentaculata	•	•	•	•	Pisidium nitidum	•			•	
Caspia milaePisidium subtruncatumImage: Second Secon	Borysthenia naticina		•		•	Pisidium sp.	•			•	
Esperiana acicularis••Pisidium supinum•••Esperiana esperi•••Pseudanodonta complanata•••Galba truncatula•••Sinanodonta woodiana•••Gyraulus albus•••Sphaerium corneum•••Hippeutis complanatus•••Sphaerium corneum•••Holandriana holandrii•••Sphaerium rivicola•••Lithoglyphus naticoides•••Sphaerium sp.••••Lymnaea stagnalis•••Sphaerium sp.•••••Microcolpia acicularis•••Unio pictorum•••••Physella acuta•••Unio pictorum••••••Physella acuta/heterostropha•••Unio tumidus•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <td>Caspia milae</td> <td></td> <td></td> <td>•</td> <td></td> <td>Pisidium subtruncatum</td> <td>•</td> <td></td> <td></td> <td>•</td>	Caspia milae			•		Pisidium subtruncatum	•			•	
Esperiana esperi•••••••Galba truncatula••••••••Galba truncatula•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••<	Esperiana acicularis	•	•	•		Pisidium supinum	•			•	
Galba truncatula • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Esperiana esperi	•	•	•	•	Pseudanodonta complanata				•	
Gyraulus albus••Sphaerium corneum••Hippeutis complanatus••Sphaerium ovale••Holandriana holandrii••Sphaerium ovale••Holandriana holandrii•••Sphaerium rivicola••Lithoglyphus naticoides••••••Lymnaea stagnalis•••Sphaerium sp.•••Microcolpia acicularis•••Sphaerium sp.••••Physa fontinalis•••Unio pictorum•••••Physella acuta•••Unio sp.••••••Physella acuta/heterostropha•••Unio tumidus••••••Planorbarius corneus•••HIRUDINEA••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	Galba truncatula	•			•	Sinanodonta woodiana		•	•	•	
Hippeutis complanatusSphaerium ovaleImage: Sphaerium ovaleHolandriana holandriiImage: Sphaerium rivicolaImage: Sphaerium rivicolaLithoglyphus naticoidesImage: Sphaerium sp.Image: Sphaerium sp.Lymnaea stagnalisImage: Sphaerium sp.Image: Sphaerium sp.Lymnaea stagnalisImage: Sphaerium sp.Image: Sphaerium sp.Microcolpia acicularisImage: Sphaerium sp.Image: Sphaerium sp.Physa fontinalisImage: Sphaerium sp.Image: Sphaerium sp.Physela acutaImage: Sphaerium sp.Image: Sphaerium sp.Physella acuta/heterostrophaImage: Sphaerium sp.Image: Sphaerium sp.Physella sp.Image: Sphaerium sp.Image: Sphaerium sp.Planorbarius corneusImage: Sphaerium sp.Image: Sphaerium sp.Planorbidae Gen. sp.Image: Sphaerium sp.Image: Sphaerium sp.Potamopyrgus antipodarumImage: Sphaerium sp.Image: Sphaerium sp.Radix balthicaImage: Sphaerium sp.Image: Sphaerium sp.Sphaerium sp.Image: Sp	Gyraulus albus		•	•		Sphaerium corneum	•			•	
Holandriana holandrii••Sphaerium rivicola••Lithoglyphus naticoides•••••••Lymnaea stagnalis•••••••••Microcolpia acicularis••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••<	Hippeutis complanatus				•	Sphaerium ovale	•			1	
Lithoglyphus naticoides•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <t< td=""><td>Holandriana holandrii</td><td></td><td></td><td>•</td><td>•</td><td>Sphaerium rivicola</td><td></td><td>•</td><td>•</td><td>1</td></t<>	Holandriana holandrii			•	•	Sphaerium rivicola		•	•	1	
Lymnaea stagnalis••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <td>Lithoglyphus naticoides</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td>Sphaerium sp.</td> <td>•</td> <td>•</td> <td></td> <td>1</td>	Lithoglyphus naticoides	•	•	•	•	Sphaerium sp.	•	•		1	
Microcolpia acicularis • • Sphaerium sp. • • • Physa fontinalis • • Unio pictorum • • • • Physela acuta • • Unio sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Lymnaea stagnalis			•	•	Unio pictorum	•	•	•	•	
Physa fontinalis • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Microcolnia acicularis		•		•	Sphaerium sp	•	•			
Physella acuta • • Unio prestanti • • Physella acuta/heterostropha • • Unio tumidus • • • Physella acuta/heterostropha • • Unio tumidus • • • • Physella sp. • • HIRUDINEA • • • • Planorbarius corneus • • Alboglossiphonia heteroclita • • • Planorbidae Gen. sp. • • Dina punctata • • • Planorbis carinatus • • Dina sp. • • • • Potamopyrgus antipodarum • • Erpobdella octoculata • • • Radix auricularia • • Glossinhonia complanata • • •	Physa fontinalis		•	•			•	•	•	•	
Physella acuta/heterostropha • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <td< td=""><td>Physella acuta</td><td></td><td></td><td>•</td><td>•</td><td>Unio sp</td><td></td><td></td><td>•</td><td>•</td></td<>	Physella acuta			•	•	Unio sp			•	•	
Physella sp. • HIRUDINEA Planorbarius corneus • • Planorbidae Gen. sp. • • Planorbis carinatus • • Potamopyrgus antipodarum • • Radix auricularia • • Badix balthica • •	Physella acuta/heterostropha		•			Unio tumidus		•	•	•	
Planorbarius corneus • • Alboglossiphonia heteroclita • • Planorbidae Gen. sp. • Dina punctata • • • Planorbidae Gen. sp. • Dina punctata • • • Planorbis carinatus • Dina sp. • • • Potamopyrgus antipodarum • • Erpobdellidae Gen. sp. • • Radix auricularia • • Glossinhonia complanata • • •	Physella sp.	•				HIRUDINEA	1		-		
Planorbidae Gen. sp. • Dina punctata • Planorbis carinatus • Dina sp. • Potamopyrgus antipodarum • • Erpobdella octoculata • Radix auricularia • • Glossinbonia complanata • •	Planorbarius corneus		1	•	•	Alboglossiphonia beteroclita				•	
Planorbis carinatus • Dina sp. • Potamopyrgus antipodarum • • Erpobdella octoculata • • Radix auricularia • • Erpobdellidae Gen. sp. • • Badix balthica • • Glossiphonia complanata • •	Planorbidae Gen sp			-	•	Dina nunctata	•		1	•	
Potamopyrgus antipodarum • • Erpobdella octoculata • • Radix auricularia • • Erpobdellidae Gen. sp. • • Badix balthica • • Glossiphonia complanata • •	Planorbis carinatus			•		Dina sn	-		1	•	
Radix auricularia • Erpobdellidae Gen. sp. • • Badix balthica • Glossiphonia complanata • •	Potamonyrgus antipodarum	•		•	•	Ernobdella octoculata	•		•	•	
Radix balthica	Radix auricularia		•			Erpobdellidae Gen sp	•	1	•	•	
	Radix balthica				•	Glossiphonia complanata	•		•	•	

Taxon nameB B B BB B BF B BTaxon nameB B B B BB B B B BHelobdella stagnalisIIIIIIPisiciola geometraIIIIIIPisiciola parentiIIIIIIPisiciola parentiIIIIIIPOLYCARTAIIIIIIIPOLYCARTAIIIIIIIPOLYCARTAIIIIIIIHygania involtaIIIIIIIAludorlius japonicusIIITubficts pape.IIIAludorlius inmobiusIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII <tdi< td="">IIII<</tdi<>		Danube						Danube		~
Helbodella stagnalis • • Navna appendiculata • Pisicola geometra • • Savina appendiculata • POYCHAETA Syloraperma ferox • • POYCHAETA Syloraperma ferox • • POYCHAETA Syloralia lacustris • • • Aulodrilus japonicus • • • • • Aulodrilus japonicus • • • • • • Aulodrilus japonicus • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Taxon name	Upper	Middle	Lower	Tributary	Taxon name	Upper	Middle	Lower	Tributary
Piscicola geometra • • Slavina appendiculata • Piscicola haranti • • Slytosperma ferox • Piscicola haranti • • • • Piscicola haranti • • • • Piscicola haranti • • • • • OLIGOCHAETA Stylodrilus sp. • • • • Aulodrilus japonicus • • Tublifex sp. • • • Aulodrilus juriseta • • Tublifex tublifex • • • • Bothinoneurum vejdoxskyanum • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Helobdella stagnalis			•	•	Rhynchelmis limosella				•
Pisciola haranti Spirosperma ferox Kylaria lacustris Impania invalida Stylaria lacustris Impania invalida <liim< td=""><td>Piscicola geometra</td><td></td><td>•</td><td>•</td><td>•</td><td>Slavina appendiculata</td><td></td><td></td><td>•</td><td></td></liim<>	Piscicola geometra		•	•	•	Slavina appendiculata			•	
POLYCHAETA Styladri lacustris • • • Hypania invalida • • Stylodrilus sp. • • OLGGCHAETA Stylodrilus sp. • • • • • Auldorlius inmobius • • Tubifex tubifex • • • • Auldorlius inmobius • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Piscicola haranti				•	Spirosperma ferox			•	
Hypania invalida • • Stylodrilus heringianus • OLIGOCHAETA Stylodrilus sp. • • Auldorfilus japonicus • • • Auldorfilus japonicus • • • • Auldorfilus juriseta • • • • • Branchiurs owerbyi • • • • • • Branchiurs owerbyi • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	POLYCHAETA	•				Stylaria lacustris		•	•	•
OLGOCHAETA Stylodrilus sp. • • Aulodrilus janonicus • • Tubifex sp. • • Aulodrilus jonicus • • • • • • Aulodrilus jonicus • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •<	Hypania invalida	•	•	•	•	Stylodrilus heringianus	•			•
Aulodrilus japonicus • Tubifex p. • • Aulodrilus juristeta • Tubifex tubifex • • • Bothnoneurum vejdovskyanum • CRUSTACEA • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	OLIGOCHAETA					Stylodrilus sp.				•
Aulodrilus jimnoblus • Tubifex tubifex • • Aulodrilus pluriseta • • • • • Branchurd Sowerbyi • • • • • • • Branchurd Sowerbyi • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •<	Aulodrilus japonicus	•			•	Tubifex sp.				•
Audorlius pluriseta • Tubiffcidae Gen. sp. • • Bothrioneurum vejdovskyanum • • CRUSTACEA Branchiorlius hortensis • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <	Aulodrilus limnobius		•			Tubifex tubifex		•	•	•
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Branchiodrilus hortensis Asellus aquaticus • • Branchioura sowerbyi • • Astacidae Gen. sp. • Cirdofful stacuum • • Astacus sataus • • Dero digitata • • Astacus leptodacylus • • Dero durcatus • • Chelicorophium sp. • • Dero dutua • • Corophium chelicorne • • Embolocephalus velutinus • • • • • • • Embolocephalus velutinus • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Bothrioneurum vejdovskyanum				•	CRUSTACEA				
Branchiura sowerbyi • • Astacidae Gen. sp. • Cridofilus lacuum • • Astacus astacus • Dero digitata • • Astacus leptodactylus • Dero bitusa • • Chelicorophium curvispinum • • Dero obtusa • • Corophium curvispinum • • Eseniella tetraedra • • Corophium curvispinum • • Enchytraeidae Gen. sp. • • • • • • Linnodrilus cervix • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Branchiodrilus hortensis				•	Asellus aquaticus		•	•	•
Criodrilus lacuum•Astacus astacus•Dero digitata•Astacus leptodactylus•Dero ducatus•Chelicorophium sp.•Dero obtusa••Corophium chelicorne•Eiseniella tetraedra••Corophium cowispinum••Embolocephalus velutinus•••••Embolocephalus velutinus••••••Enchytraeidae Gen. sp.•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• </td <td>Branchiura sowerbyi</td> <td>•</td> <td>•</td> <td>•</td> <td>٠</td> <td>Astacidae Gen. sp.</td> <td></td> <td></td> <td></td> <td>•</td>	Branchiura sowerbyi	•	•	•	٠	Astacidae Gen. sp.				•
Dero digitata • Astacus leptodactylus • • Dero drucatus • Chelicorophium sp. • • Dero obtusa • Corophium curvispinum • • Eiseniella tetraedra • • Corophium robustum • • Embolocephalus velutinus • • • • • Enchytraeidae Gen. sp. • • • • • • Isochaetides michaelseni • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Criodrilus lacuum	•			٠	Astacus astacus			•	
Dero furcatus • Chelicorophium chelicorne • Dero obtusa • Corophium curvispinum • • Eiseniella tetraedra • Corophium curvispinum • • Embolocephalus velutinus • Corophium sowinskyi • • Isochaetides michaelseni • • Corophium sowinskyi • • Isochaetides michaelseni • • Corophium sowinskyi • • • Linmodrilus cervix Dikerogammarus haemobaphes • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <td< td=""><td>Dero digitata</td><td></td><td></td><td>•</td><td></td><td>Astacus leptodactylus</td><td></td><td>•</td><td>•</td><td></td></td<>	Dero digitata			•		Astacus leptodactylus		•	•	
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Embolocephalus velutinus•••••Enchytraeidae Gen. sp.••Corophium sowinskyi•••Isochaetides michaelseni•••Corophium sp.•••Isochaetides michaelseni••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• </td <td>Eiseniella tetraedra</td> <td>•</td> <td></td> <td></td> <td>•</td> <td>Corophium curvispinum</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td>	Eiseniella tetraedra	•			•	Corophium curvispinum	•	•	•	•
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Immodrilus claparedeanus••Dikerogammarus haemobaphes•Limnodrilus hoffmeisteri••Dikerogammarus haemobaphes••Limnodrilus profundicola••Dikerogammarus yaenobaphes••Limnodrilus psp.•••••Limnodrilus sp.•••••Limnodrilus sp.•••••Limnodrilus dekemianus•••••Lumbricidae Gen. sp.•••••Lumbriculus variegatus••••••Lumbriculus variegatus•••••••Nais alpina••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	Limnodrilus cervix				•	Dikerogammarus bispinosus	•	•		•
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Limnodrilus profundicola•Dikerogammarus vilosus••Limnodrilus profundicola••Echinogammarus vilosus•••Limnodrilus profundicola••Echinogammarus vilosus••••Limnodrilus gp.••Echinogammarus sp.••••••Lumbricillus udekemianus•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <t< td=""><td>Limnodrilus hoffmeisteri</td><td>•</td><td>•</td><td>•</td><td>•</td><td>Dikerogammarus sp.</td><td>•</td><td>•</td><td></td><td>•</td></t<>	Limnodrilus hoffmeisteri	•	•	•	•	Dikerogammarus sp.	•	•		•
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Dimodritus udekemianus•Ethinogammarus sp.Lumbricilus rivalis•••Lumbricillus rivalis•••Lumbricillus variegatus•••Mais alpina•••Nais alpina•••Nais behningi•••Nais behningi•••Nais parbata•••Nais parbata•••Nais pardalis•••Nais pardalis•••Nais parbata•••Nais parbata•••Nais pardalis•••Nais parbata•••Nais parbata•••Nais parbata•••Nais parbata•••Nais simplex•••Nais simplex•••Nais sp.•••Oligochaeta Gen. sp.••Oligochaeta Gen. sp.••Ophidonais serpentina••Potamothrix bavaricus••Potamothrix bavaricus••Potamothrix hammoniensis••Potamothrix hammoniensis••Potamothrix hammoniensis••Potamothrix hammoniensis••Potamothrix hammoniensis••Potamothrix hammoniensis••Pot				•	•	Echinogammarus ischnus	•	•	•	•
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Nais pardalis•Mysidae Gen. sp.•Nais simplex•••••Nais simplex••••••Nais sp.•••••••Nais variabilis••••••••Oligochaeta Gen. sp.•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	Nais elinguis				•	Limnomysis benedeni	•	•	•	•
Nais simplex••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <th< td=""><td>Nais pardalis</td><td></td><td></td><td>•</td><td></td><td>Mysidae Gen. sp.</td><td></td><td>•</td><td></td><td><u> </u></td></th<>	Nais pardalis			•		Mysidae Gen. sp.		•		<u> </u>
Nais sp.••Orconectes limosus••Nais variabilis•••••••Oligochaeta Gen. sp.••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <td>Nais simplex</td> <td></td> <td></td> <td>•</td> <td></td> <td>Obesogammarus obesus</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td>	Nais simplex			•		Obesogammarus obesus	•	•	•	•
Nais variabilis•Ostracoda Gen. sp.•Oligochaeta Gen. sp.••Paramysis lacustris••Ophidonais serpentina•Paramysis sp.•••Paranais frici•••••Potamothrix bavaricus•••••Potamothrix danubialis•••••Potamothrix hammoniensis•••••Potamothrix vejdovskyi•••Baetis buceratus•Potamothrix vejdovskyi•••••Psammoryctides albicola•••••Psammoryctides moravicus•••••Psammoryctides moravicus•••••Paramoticus••••••Paramoticus••••••Potamothrix hammoniensis••••••Potamothrix vejdovskyi••••••Potamothrix vejdovskyi••••••Psammoryctides albicola••••••Paramotyctides moravicus••••••Paramotyctides moravicus••••••Paramotyctides moravicus••••••Paramotyctides moravicus	Nais sp.			•	•	Orconectes limosus		•	•	•
Oligochaeta Gen. sp.•Paramysis lacustris•••Ophidonais serpentina•Paramysis sp.•••Paranais frici•••••Potamothrix bavaricus•••••Potamothrix danubialis•••••Potamothrix hammoniensis•••••Potamothrix moldaviensis•••••Potamothrix vejdovskyi•••Baetis buceratus••Potamothrix vejdovskyi•••Baetis fuscatus••Psammoryctides albicola•••Caenis horaria••Psammoryctides moravicus••••••	Nais variabilis			•		Ostracoda Gen. sp.	•			
Ophidonais serpentina • Paramysis sp. • Paranais frici • • Synurella ambulans • Potamothrix bavaricus • • HYDRACHNIDIA • Potamothrix danubialis • • HYDRACHNIDIA • Potamothrix hammoniensis • • EPHEMEROPTERA • • Potamothrix vejdovskyi • • Baetis buceratus • • Potamothrix vejdovskyi • • Baetis fuscatus • • Psammoryctides albicola • • Baetis vernus • • Psammoryctides moravicus • • • Caenis horaria •	Oligochaeta Gen. sp.	•				Paramysis lacustris	•	•	•	1
Paranais frici • • Synurella ambulans • Potamothrix bavaricus • • HYDRACHNIDIA Potamothrix danubialis • • Hydrachnidia Gen. sp. • Potamothrix hammoniensis • • EPHEMEROPTERA • Potamothrix noldaviensis • • Baetis buceratus • • Potamothrix vejdovskyi • • Baetis fuscatus • • Potamothrix vejdovskyi • • Baetis fuscatus • • Psammoryctides albicola • • Baetis vernus • • Psammoryctides barbatus • • • Caenis horaria • Psammoryctides moravicus • • • Caenis luctuosa •	Ophidonais serpentina			•		Paramysis sp.		•		1
Potamothrix bavaricus • • HYDRACHNIDIA Potamothrix danubialis • Hydrachnidia Gen. sp. • Potamothrix hammoniensis • • EPHEMEROPTERA Potamothrix vejdovskyi • • Baetis buceratus • Potamothrix vejdovskyi • • Baetis fuscatus • • Psammoryctides albicola • • Baetis vernus • • Psammoryctides barbatus • • • Caenis horaria • •	Paranais frici			•	•	Synurella ambulans				•
Potamothrix danubialis • Hydrachnidia Gen. sp. • Potamothrix hammoniensis • • EPHEMEROPTERA Potamothrix moldaviensis • • Baetis buceratus • Potamothrix vejdovskyi • • Baetis fuscatus • • Potamothrix vejdovskyi • • Baetis fuscatus • • Psammoryctides albicola • • Baetis vernus • • Psammoryctides barbatus • • • Caenis horaria • Psammoryctides moravicus • • • • •	Potamothrix bayaricus	1	•	1	•	HYDRACHNIDIA		1	1	1
Potamothrix hammoniensis • • EPHEMEROPTERA Potamothrix moldaviensis • • Baetis buceratus Potamothrix vejdovskyi • • Baetis fuscatus Potamothrix vejdovskyi • • Baetis fuscatus Psammoryctides albicola • • Baetis vernus Psammoryctides barbatus • • Caenis horaria Psammoryctides moravicus • • Caenis luctuosa	Potamothrix danubialis	1	1	•		Hydrachnidia Gen. sp.		1		•
Potamothrix moldaviensis • • Baetis buceratus • Potamothrix vejdovskyi • • Baetis fuscatus • • Psammoryctides albicola • • Baetis vernus • • Psammoryctides barbatus • • • Caenis horaria • Psammoryctides moravicus • • • Caenis luctuosa •	Potamothrix hammoniensis	1	•	•	•	EPHEMEROPTERA		1	1	1
Potamothrix vejdovskyi • • Baetis bactis ducidadi Psammoryctides albicola • • Baetis vernus Psammoryctides barbatus • • • Psammoryctides moravicus • • •	Potamothrix moldaviensis	•	•	•	•	Baetis buceratus		1		•
Psammoryctides albicola • • Baetis vernus • Psammoryctides barbatus • • • Caenis horaria • Psammoryctides moravicus • • • Caenis luctuosa •	Potamothrix veidovskvi	•	1	•	•	Baetis fuscatus	•	1	1	•
Psammoryctides barbatus • • • Caenis horaria • Psammoryctides moravicus • • Caenis luctuosa •	Psammorvctides albicola	1	•	•	•	Baetis vernus		1	•	<u>†</u>
Psammoryctides moravicus	Psammoryctides barbatus	•	•	•	•	Caenis horaria		1	•	<u>†</u>
	Psammoryctides moravicus	1	1	1	•	Caenis luctuosa	•	1	1	<u>†</u>

Taxon nameand bby by byby by byby by by byby by by by by censis macruraby by by by by censis pacudorivulorumiiiiCaenis macrura Caenis pseudorivulorumiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii <t< th=""><th></th><th colspan="2">Danu</th><th>e</th><th></th><th></th><th></th><th>Danub</th><th>e</th><th></th></t<>		Danu		e				Danub	e	
Caenis macrura • • Leuctra sp. • • Caenis preudorirulorum • Aphelocherus aestivalis • • Caenis preudorirulorum • Aphelocherus aestivalis • • Caenis probusta • • Aquarus paludum paludum • • Caenis sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Taxon name	Upper	Middle	Lower	Tributary	Taxon name	Upper	Middle	Lower	Tributary
Caenis macrura-Gr. • • HETEOPTERA Caenis speudorivulorum • • Aphelocheirus aestivalis • • Caenis robusta • • Aquarius paludum paludum • • Caenis robusta • • Gerris lacustris • • Caenos robusta • • Micronecta poweri • • • Cloeon sp. • • Micronecta sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Caenis macrura	•			•	Leuctra sp.	•			•
Caenis pseudorivulorum AppleOcheirus aestivalis Aquarius patudum patudum Caenis sp. Gerris lacustris Centroptilum luteolum Illycoris cimicoides Centorptilum luteolum Illycoris cimicoides Centorptilum luteolum Illycoris cimicoides Centorptilum luteolum Illycoris cimicoides Centorptilum luteolum Micronecta sp. Micronecta sp. Micronecta sp. Micronecta sp. Eddyonurus starmachi Plea minutissima Eddyonurus starmachi Plea minutissima Eddyonurus starmachi Eddyonurus starmachi Ephemera sp. Sigara dorsalis Ephemera vulgata Sigara dorsalis Ephemera vulgata Sialis lutaria Ephemera vulgata Acentria sp. Iephonon virgo Lephopon virgo Lephopon virgo Lephopon virgo Lephopon virgo Labiobactis tricolor Sisva sp. Nymphula sp. Potamanthus luteus Berosus spinosus lv. Potamathus luteus Elmis aenea/maugetii Anax imperator Elmis aenea/maugetii Anax sp. Elmis sp. Elmis sp. Elmis sp. Elmis aenea/maugetii Elmis sp. <l< td=""><td>Caenis macrura-Gr.</td><td></td><td>•</td><td></td><td>•</td><td>HETEROPTERA</td><td></td><td></td><td></td><td></td></l<>	Caenis macrura-Gr.		•		•	HETEROPTERA				
Caenis robusta • Aquarius paludum paludum • Caenis sp. Gerris laaustris • • Centroptilum luteolum • Ilyccoris cinicoides • Cleoon ofipterum • • Micronecta sp. • Eddyonurus sp. • • Micronecta sp. • Eddyonurus sp. • • Micronecta sp. • Eddyonurus venosus • Ranatra linearis • • Eddyonurus venosus • Ranatra linearis • • Ephemera dancia • • Sigara dorsalis • • Ephemera ancia • • Sigara striata • • Ephemera vulgata • • Sialis lutaria • • Ephemera vulgata • • Nymphula sp. • • Heptagenia flava • • NeuROPTERA • • Labobaetis tricolor • • Nymphula sp. • • Oligoneuriella rhenana • • NeuROPTERA • • Labobaetis tricolor • > > • • Oligoneuriella rhenana • •	Caenis pseudorivulorum			•	•	Aphelocheirus aestivalis		•	•	•
Caenis sp. Gerris lacustris Inycooris cinicoides Inycooris cinicoides Interpretation I	Caenis robusta		•		•	Aquarius paludum paludum			•	
Centroptilum luteolum Ilyocoris cimicoldes Micronecta poweri Cleeon sp. Micronecta sp. Sigara stratata Iphemera danica Sigara stratata Iphemera danica Sialis sp. Iphenera admica Sialis sp. Iphony ingo Iphony ingo ingo ingo ingo ingo ingo ingo ingo	Caenis sp.				•	Gerris lacustris		•		
Cloeon dipterum • • Micronecta pp. • Cloeon sp. • Micronecta sp. • • Eddyonurus sp. • Micronecta sp. • • Eddyonurus starmachi • Plea minutissima • • Eddyonurus venosus-Gr. • Sigara dorsalis • • Ephemera danica • • Sigara striata • • Ephemera funeata • • Sialis lutaria • • Ephemera funeata • • Sialis sp. • • • Ephemera virgo • • • Accentria sp. • • • Heptagenia fava • • • • • • • • Heptagenia sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • </td <td>Centroptilum luteolum</td> <td></td> <td></td> <td></td> <td>•</td> <td>Ilyocoris cimicoides</td> <td></td> <td>•</td> <td>•</td> <td></td>	Centroptilum luteolum				•	Ilyocoris cimicoides		•	•	
Cloeon sp. • Microvella sp. • • Eddyonurus starmachi • Microvella sp. • • Eddyonurus starmachi • Plea minuttssima • • Eddyonurus venosus • • • Sigara dorsallis • • Eddyonurus venosus •Gr. • • • • • • Eddyonurus venosus •Gr. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • </td <td>Cloeon dipterum</td> <td></td> <td>•</td> <td>•</td> <td>•</td> <td>Micronecta poweri</td> <td>•</td> <td></td> <td></td> <td></td>	Cloeon dipterum		•	•	•	Micronecta poweri	•			
Eddyonurus sp. Microvelia sp. • Eddyonurus starmachi • Plea minutissima • Eddyonurus venosus • Ranatra linearis • Eddyonurus venosus-Gr. • • Sigara striata • Ephemera danica • • Sigara striata • • Ephemera ineata • • Sialis lutaria • • Ephemera sulgata • • Sialis lutaria • • Ephemera vulgata • • • • • • Heptagenia fava • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Cloeon sp.				•	Micronecta sp.	•			•
Ecdyonurus starmachi Plea minutissima • • Edyonurus venosus - Cr. Ranatra linearis • • Edyonurus venosus - Cr. • Sigara dorsalis • • Edyonurus venosus - Cr. • Sigara dorsalis • • Ephemera danica • • MEGALOPTERA • • Ephemera vulgata • • Sialis sp. • • • Ephemera vulgata • • Acentria sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Ecdyonurus sp.				•	Microvelia sp.			•	
Ecdyonurus venosus Gr. • Ranatra linearis • Ecdyonurus venosus Gr. • Sigara dorsalis • Ephemera danica • • Sigara dorsalis • Ephemera danica • • Sigara triata • • Ephemera and anica • • Sialis tutaria • • Ephemera vulgata • • Sialis tutaria • • Ephemera vulgata • • • • • • Ephomera vulgata • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • </td <td>Ecdyonurus starmachi</td> <td></td> <td></td> <td></td> <td>•</td> <td>Plea minutissima</td> <td></td> <td>٠</td> <td>•</td> <td></td>	Ecdyonurus starmachi				•	Plea minutissima		٠	•	
Ecdyonurus venosus-Gr. • Sigara dorsalis • Ephemera danica • Sigara striata • Ephemera lineata • MEGALOPTERA Ephemera vulgata • • Sialis lutaria • Ephemera vulgata • • • • Ephemera vulgata • • • • Ephoron virgo • • • • • Heptagenia sp. • • • • • • Heptagenia suphurea • • • • • • • Labiobaetis tricolor • • Sisyra sp. • • • • Potananthus luteus • • Berosus spinosus Lv. • • • Procloeon bifidum • Bidessus delicatulus • • • • Aeshna sp. • • Elmis aenea • • • • • • • • • • • • • • •<	Ecdyonurus venosus	•				Ranatra linearis			•	
Ephemera Inneata • Sigara striata • Ephemera Inneata • MEGALOPTERA Ephemera sp. • Sialis sp. • Ephemera vulgata • • Sialis sp. • Ephoron virgo • • EPhotopTERA Heptagenia sp. • • • • Heptagenia sp. • • • • Ideotaetis tricolor • • • • Oligoneuriella rhenana • • • • • Portoeon bifidum • • • • • • • Procloeon bifidum • • Bidessus delicatulus • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Ecdyonurus venosus-Gr.	•			•	Sigara dorsalis				•
Ephemera lineata • MEGALOPTERA Ephemera sp. • Sialis lutaria • Ephemera vulgata • Sialis sp. • Ephemera vulgata • • Acentria sp. • Heptagenia flava • • Acentria sp. • • Heptagenia sulphurea • • Acentria sp. • • Heptagenia sulphurea • • Acentria sp. • • Oligoneurielia rhenana • • COLEOPTERA • • Procloeon bifidum • Bidessus delicatulus • • • Serratella ignita • • Dytiscus marginalis • • ODONATA Dytiscus marginalis • • • • Anax inperator • Elmis aenea • • • • Calopteryx splendens • • Elmis sp. • • • • Gomphus flavipes • • Haliplus sp. • • • • •	Ephemera danica	•	•			Sigara striata				•
Ephemera sp. • Sialis lutaria • Ephemera vulgata • Sialis sp. • Ephoron virgo • • Sialis sp. • Heptagenia flava • • • Acentria sp. • Heptagenia sp. • • • Acentria sp. • • Heptagenia sp. • • • NEUROPTERA • • Heptagenia sp. • • • • • • • Oligoneuriella rhenana • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Ephemera lineata	•	•			MEGALOPTERA				
Ephemera vulgata • Sialis sp. • Ephoron virgo • • Acentria sp. • Heptagenia flava • • Acentria sp. • Heptagenia sulphurea • • Acentria sp. • Labiobaetis tricolor • • NEUROPTERA Labiobaetis tricolor • • • • Oligoneuricalia rhenana • • • • • Potamanthus luteus • • Berosus spinosus Lv. • • Procloeon bifidum • Bidessus delicatulus • • • Serratella ignita • • Dytiscidae Gen. sp. • • ODONATA Dytiscus marginalis • • • • • Acentry x splendens • Elmis aenea/maugetii • • • • Calopteryx splendens • Esolus sp. • • • • • • • • • • • • • • •	Ephemera sp.		•			Sialis lutaria				•
Image: Construction of the system of the	Ephemera vulgata	•			•	Sialis sp.	•			
Import of the product of the produc	Ephoron virgo	•			•	LEPIDOPTERA				
Impage intervent Impage intervent Impage intervent Heptagenia suphyrea Impage intervent Impage intervent Labiobaetis tricolor Impage intervent Impage intervent Oligoneuriella rhenana Impage intervent Impage intervent Potamanthus luteus Impage intervent Impage intervent Potamanthus luteus Impage intervent Impage intervent Serratella ignita Impage intervent Impage intervent Serratella ignita Impage intervent Impage intervent ODONATA Dytiscus marginalis Impage intervent Anax sp. Impage intervent Impage intervent Calopteryx splendens Impage intervent Impage intervent Calopteryx virgo Impage intervent <td>Heptagenia flava</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td>Acentria sp.</td> <td></td> <td>•</td> <td></td> <td></td>	Heptagenia flava	•	•	•	•	Acentria sp.		•		
Inspirato Spir Inspirato Spir Inspirato Spir Iteptagenia sulphurea Inspirato Spir Inspirato Spir Labiobaetis tricolor Inspirato Spir Inspirato Spir Obigoneuriella rhenana Inspirato Spir Inspirato Spir Potamanthus luteus Inspirato Spir Inspir Pordoeon bifidum Inspir Inspir Serratella ignita Inspir Inspir ODNATA Dytiscus marginalis Inspir Acshna sp. Inspir Inspir Anax imperator Inspir Inspir Anax spir Inspir Inspir Calopteryx splendens Inspir Inspir Calopteryx virgo Inspir Inspir Coenagrion sp. Inspir Inspir Erythromma viridulum Inspir Inspir Gomphus flavipes Inspir Inspir Gomphus flavipes Inspir Inspir Ischnura elegans Inspir Inspir Ischnura elegans Inspir Inspir Ischnura elegans Inspir Inspir Ischnura elegans I	Hentagenia sp	•			•	Nymphula sp			•	
Indeparted with the second	Heptagenia sulphurea	•		•	•	NEUROPTERA		1		
Dilgoneuriella rhenana • COLOPTERA Potamanthus luteus • Berosus spinosus Lv. • Procloeon bifidum • Bidessus delicatulus • Serratella ignita • Dytiscidae Gen. sp. • ODONATA Dytiscidae Gen. sp. • • Acshna sp. • Elmis aenea/maugetii • • Anax imperator • Elmis aenea/maugetii • • Calopteryx splendens • Esolus parallelepipedus • • Calopteryx virgo • Esolus parallelepipedus • • • Calopteryx virgo • • Haliplus sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Labiobaetis tricolor			•	•	Sisvra sn		•		•
Orgonizationalis Image: Spinosus LV. Procloeon bifidum Image: Spinosus LV. Procloeon bifidum Image: Spinosus LV. Serratella ignita Image: Dytiscus marginalis Jobox MAT Dytiscus marginalis Aeshna sp. Image: Elmis aenea Anax imperator Image: Elmis aenea Anax sp. Image: Elmis spinosus LV. Calopteryx splendens Image: Elmis spinosus LV. Calopteryx virgo Image: Elmis spinosus LV. Comage: Elmis spinosus LV. Im	Oligoneuriella rhenana			-	•			-		
Procleeon bifidum	Potamanthus luteus	•			•	Berosus spinosus Ly				•
Anax construction Image: Construction of the construction of	Procloeon bifidum	•			•	Bidessus delicatulus	•			-
ODONATA Dyticute marginalis • Aeshna sp. • Elmis aenea • Anax imperator • Elmis aenea/maugetii • Anax sp. • Elmis aenea/maugetii • • Calopteryx splendens • Esolus parallelepipedus • • Calopteryx virgo • • Esolus psp. • • Coenagrion sp. • Haliplus sp. • • • Gomphus flavipes • • Hydrophilidae Gen. sp. • • Gomphus vulgatissimus • • Laccophilus sp. • • • Ischnura elegans/pumilio • • Macronychus quadrituberculatus • • • Libellula fulva • • Oulimnius sp. • • • • Onychogomphus forcipatus • • Oulimnius sp. • • • Odonata Gen. sp. • • Oulimnius sp. • • • • • Ohychogomphus/Ophiogomphus • <td< td=""><td>Serratella ignita</td><td>•</td><td></td><td></td><td>•</td><td>Dytiscidae Gen sn</td><td></td><td></td><td></td><td>•</td></td<>	Serratella ignita	•			•	Dytiscidae Gen sn				•
ObstantialOppositionAeshna sp.Elmis aeneaAnax imperatorElmis aenea/maugetiiAnax sp.Elmis aenea/maugetiiCalopteryx splendensElmis sp.Calopteryx splendensEsolus parallelepipedusCalopteryx virgoEsolus sp.Coenagrion sp.Haliplus sp.Erythromma viridulumHydrobius fuscipesGomphus flavipesEGomphus vulgatissimusELischnura elegansElimnius sp.Ischnura elegansElimnius sp.Libellula fulvaOretochilus villosusOdonata Gen. sp.EOdonata Gen. sp.EOdonata Gen. sp.EIbellula fulvaOretochilus sp.Odonata Gen. sp.EOdonata Gen. sp.EOhychogomphus forcipatusEOulimnius sp.EOnychogomphus forcipatusEOnychogomphus ceciliaEOrthetrum cancellatumRiolus sp.Orthetrum sp.Riolus sp.Orthetrum sp.EPlatycnemis pennipesStenelmis canaliculataZygoptera Gen. sp.Stenelmis sp.Platycnemis pennipesStenelmis sp.Platycnemis pennipesAgraylea sexmaculataLeuctra geniculataAgraylea sexmaculataLeuctra geniculataAgraylea sexmaculataLeuctra geniculataAgraylea sexmaculata	ODONATA					Dytiscus marginalis			•	
Anax imperatorElmis aenea/maugetiiAnax imperator•Anax sp.•Calopteryx splendens•Calopteryx virgo•Calopteryx virgo•Calopteryx virgo•Calopteryx virgo•Coenagrion sp.•Erythromma viridulum•Haliplus sp.•Gomphus flavipes•Gomphus vulgatissimus•Ischnura elegans•Ischnura elegans/pumilio•Lestes sp.•Orectochilus villosus•Ubellula fulva•Onychogomphus forcipatus•Onychogomphus forcipatus•Ophiogomphus cecilia•Orthetrum cancellatum•Riolus sp.•Orthetrum sp.•Orthetrum sp.•Orthetrum sp.•Orthetrum sp.•Orthetrum sp.•Onthetrum sp.•Orthetrum sp.•	Aeshna sh			•		Elmis aenea	•	•		
Anax sp.Elmis sp.Image of the sp.Calopteryx splendensElmis sp.Image of the sp.Calopteryx virgoImage of the sp.Image of the sp.Coenagrion sp.Image of the sp.Image of the sp.Erythromma viridulumImage of the sp.Image of the sp.Gomphus flavipesImage of the sp.Image of the sp.Gomphus vulgatissimusImage of the sp.Image of the sp.Gomphus vulgatissimusImage of the sp.Image of the sp.Ischnura elegansImage of the sp.Image of the sp.Ischnura elegans/pumilioImage of the sp.Image of the sp.Ischnura elegans	Anax imperator				•	Elmis aenea/maugetii	•			
Calopteryx splendens•Esolus parallelepipedus•Calopteryx virgo••Esolus sp.•Coenagrion sp.••Haliplus sp.••Erythromma viridulum•Hydrobius fuscipes•••Gomphus flavipes•••Hydrophilidae Gen. sp.••Gomphus vulgatissimus••••••Gomphus vulgatissimus••••••Ischnura elegans•••••••Ischnura elegans/pumilio••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <td< td=""><td>Anax sp</td><td></td><td></td><td></td><td>•</td><td>Elmis sp</td><td>•</td><td></td><td></td><td>•</td></td<>	Anax sp				•	Elmis sp	•			•
Calopteryx virgo•Esolus sp.•Calopteryx virgo••Esolus sp.•Coenagrion sp.••Haliplus sp.•Erythromma viridulum••Hydrobius fuscipes•Gomphus flavipes•••Hydrophilidae Gen. sp.•Gomphus vulgatissimus•••Laccophilus sp.••Ischnura elegans••Limnius sp.•••Ischnura elegans/pumilio••Limnius volckmari•••Lestes sp.••Macronychus quadrituberculatus•••Uibellula fulva••Orectochilus villosus•••Odonata Gen. sp.•••Oulimnius sp.•••Onychogomphus forcipatus•••Oulimnius tuberculatus•••Onychogomphus cecilia•••Oulimnius tuberculatus••••Orthetrum cancellatum••Riolus sp.••••••Orthetrum sp.••••Stenelmis canaliculata•••••PlaccoPTERA•••••••••••••••••••••••••••••••••<	Calopteryx splendens	•			•	Esolus parallelepipedus	•			
Coenagrion sp.•Haliplus sp.•Erythromma viridulum•Hydrobius fuscipes•Gomphus flavipes••Hydrobius fuscipes•Gomphus vulgatissimus••Laccophilus sp.•Ischnura elegans••Laccophilus sp.•Ischnura elegans/pumilio••Limnius volckmari•Lestes sp.•••Macronychus quadrituberculatus•Odonata Gen. sp.•••Oulimnius sp.•Onychogomphus forcipatus•••••Onychogomphus cecilia•••••Orthetrum cancellatum••Riolus sp.••Orthetrum sp.•••••Platycnemis pennipes••Stenelmis canaliculata•Zygoptera Gen. sp.•••••PLECOPTERA••Agraylea sexmaculata••Leuctra binponyus-Gr•••Allogamus auricolliis•Ieuctra binponyus-Gr••Allogamus auricolliis••Ieuctra binponyus-Gr••Allogamus auricolliis••Ieuctra binponyus-Gr••Allogamus auricolliis••Ieuctra binponyus-Gr••Allogamus auricolliis••Ieuctra binponyus-Gr•1Allogamus auricolliis••Ieuctra b	Calopteryx virgo	•	•			Esolus sp.	•			•
Erythromma viridulum•Hydrobius fuscipes•Gomphus flavipes••Hydrobiuls fuscipes•Gomphus vulgatissimus••Laccophilus sp.•Ischnura elegans••Limnius sp.•Ischnura elegans/pumilio••Macronychus quadrituberculatus•Lestes sp.••Macronychus quadrituberculatus•Ubellula fulva••••Odonata Gen. sp.••••Onychogomphus forcipatus••••Onychogomphus cecilia••••Orthetrum cancellatum••••Orthetrum sp.••••Platycnemis pennipes••••PlecOPTERA••Stenelmis sp.•Leuctra geniculata••••Leuctra geniculata••••Leuctra binopous-Gr••Alloaraus auricollis•Istance••Alloaraus auricollis••Istance••Alloaraus auricollis••Istance•Alloaraus auricollis•••Istance•Alloaraus auricollis•••Istance•Alloaraus auricollis•••Istance•Alloaraus auricollis•••Istance•Istance <td< td=""><td>Coenagrion sp.</td><td></td><td></td><td>•</td><td></td><td>Haliplus sp.</td><td>•</td><td></td><td></td><td>•</td></td<>	Coenagrion sp.			•		Haliplus sp.	•			•
Gomphus flavipes • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Erythromma viridulum				•	Hydrobius fuscipes				•
Gomphus vulgatissimus • • Laccophilus sp. • • Ischnura elegans • • Limnius sp. • • Ischnura elegans/pumilio • • Limnius sp. • • Lestes sp. • • Macronychus quadrituberculatus • • Libellula fulva • • Macronychus quadrituberculatus • • Odonata Gen. sp. • • Oulimnius sp. • • • Onychogomphus forcipatus • • Oulimnius tuberculatus • • • Onychogomphus/Ophiogomphus • • Oulimnius tuberculatus • • • Ophiogomphus cecilia • • • Oulimnius sp. • • • Orthetrum cancellatum • • • • • • • Orthetrum sp. • • • • • • • • Platycnemis pennipes • • • Stenelmis sp. • • •	Gomphus flavipes		•	•	•	Hydrophilidae Gen, sp.			•	
Ischnura elegansImage: Second Sec	Gomphus vulgatissimus		•	•	•				•	•
Ischnura elegans/pumilioImmus pineIschnura elegans/pumilioImmus volckmariLestes sp.Macronychus quadrituberculatusLibellula fulvaOrectochilus villosusOdonata Gen. sp.Oulimnius sp.Onychogomphus forcipatusOulimnius sp.Onychogomphus/OphiogomphusOulimnius tuberculatusOnychogomphus ceciliaPotamophilus acuminatusOrthetrum cancellatumRiolus sp.Orthetrum sp.Immus pinePlatycnemis pennipesStenelmis canaliculataZygoptera Gen. sp.Stenelmis sp.PLECOPTERATRICHOPTERALeuctra geniculataAgraylea sexmaculataIeuctra binpopus-GrAllogamus auricolliis	Ischnura elegans		•							•
Lestes sp. • • Macronychus quadrituberculatus • • Libellula fulva • • Macronychus quadrituberculatus • • Odonata Gen. sp. • • Oulimnius sp. • • • Onychogomphus forcipatus • • • Oulimnius tuberculatus • • Onychogomphus/Ophiogomphus • • • Oulimnius tuberculatus • • • Ophiogomphus/Ophiogomphus • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <t< td=""><td>Ischnura elegans/pumilio</td><td></td><td></td><td></td><td>•</td><td>Limnius volckmari</td><td>•</td><td></td><td></td><td>•</td></t<>	Ischnura elegans/pumilio				•	Limnius volckmari	•			•
Libellula fulva • Orectochilus villosus • • Odonata Gen. sp. • Oulimnius sp. • • • Onychogomphus forcipatus • • Oulimnius tuberculatus • • • Onychogomphus/Ophiogomphus • • Oulimnius tuberculatus • • • Ophiogomphus cecilia • • Potamophilus acuminatus • • • • Orthetrum cancellatum • • Riolus sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <td< td=""><td>lestes sn</td><td></td><td></td><td>•</td><td>•</td><td>Macronychus quadrituberculatus</td><td>•</td><td></td><td></td><td>•</td></td<>	lestes sn			•	•	Macronychus quadrituberculatus	•			•
Odonata Gen. sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Libellula fulva				•	Orectochilus villosus	•			
Onychogomphus forcipatus • • Oulimnius spin Onychogomphus/Ophiogomphus • • Oulimnius tuberculatus • Ophiogomphus/Ophiogomphus • • Potamophilus acuminatus • • Ophiogomphus cecilia • • Riolus cupreus • • • Orthetrum cancellatum • Riolus sp. • • • • Orthetrum sp. • • Riolus subviolaceus • • • Platycnemis pennipes • • Stenelmis canaliculata • • Zygoptera Gen. sp. • • Stenelmis sp. • • PLECOPTERA TRICHOPTERA • • • Leuctra geniculata • Agraylea sexmaculata • •	Odonata Gen sp				•	Oulimpius sp	•			•
Onychogomphus/Ophiogomphus • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <	Onvchogomphus forcinatus	•	•		•	Oulimpius tuberculatus	•			
Ophiogomphus cecilia • • Riolus cupreus • • Orthetrum cancellatum • Riolus sp. • • • Orthetrum sp. • • Riolus subviolaceus • • • Platycnemis pennipes • • Stenelmis canaliculata • • Zygoptera Gen. sp. • • Stenelmis sp. • • PLECOPTERA TRICHOPTERA • • • Leuctra geniculata • Agraylea sexmaculata • •	Onychogomphus/Onbiogomphus	•	-		-	Potamonhilus acuminatus	-	•	•	•
Orthetrum cancellatum • Riolus supress • • Orthetrum sp. • Riolus subviolaceus • • Platycnemis pennipes • • Stenelmis canaliculata • Zygoptera Gen. sp. • • Stenelmis sp. • PLECOPTERA TRICHOPTERA • • Leuctra geniculata • Agraylea sexmaculata •	Onbiogomphus cecilia	•			•	Riolus cupreus	•	-		-
Orthetrum sp. • Riolus subviolaceus • Platycnemis pennipes • • Stenelmis canaliculata Zygoptera Gen. sp. • • Stenelmis sp. PLECOPTERA • • • Leuctra geniculata • • Agraylea sexmaculata I euctra hinpopus-Gr • • •	Orthetrum cancellatum	-			•	Riolus sp	•			•
Platycnemis pennipes • • Stenelmis canaliculata • Zygoptera Gen. sp. • • Stenelmis sp. • PLECOPTERA TRICHOPTERA • • Leuctra geniculata • • Agraylea sexmaculata • Leuctra binpopus-Gr • • • •	Orthetrum sp	+	<u> </u>	<u> </u>	•	Riolus subviolaceus	•		<u> </u>	
Zygoptera Gen. sp. • Stenelmis sp. • PLECOPTERA TRICHOPTERA • Leuctra geniculata • Agraylea sexmaculata • Leuctra hippopus-Gr • Allogamus auricollis •	Platycnemis nennines	+	<u> </u>	•	•	Stenelmis canaliculata			<u> </u>	•
PLECOPTERA TRICHOPTERA Leuctra geniculata • Agraylea sexmaculata •	Zvgontera Gen sp	1		-	•	Stenelmis sn		1	•	-
Leuctra geniculata • Agraylea sexmaculata • Leuctra hippopus-Gr • Allogamus auricollis •	PI FCOPTERA	1	I	I	I -	TRICHOPTERA	1	1	I -	1
Leuctra hippopuls-Gr	Leuctra geniculata	•				Agraylea sexmaculata			•	
	Leuctra hippopus-Gr		•			Allogamus auricollis	•			•

Taxon nameby by byby byby by byby by byby by byby by byAnabolia furcata>>>Chironomina Gen. sp.>>>Athripsodes albifrons>>>Chironomia Gen. sp.>>>>Athripsodes albifrons>>>Chironomus duruentris>>>>>Athripsodes chereus>Chironomus adutentris>>>>>Athripsodes chereus>Chironomus nudiventris>>>>>>Brachycentus sububliusChironomus glumosus>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> <th colspan="2"></th> <th colspan="3">Danube</th> <th></th> <th></th> <th colspan="2">Danube</th> <th></th>			Danube					Danube		
Anabolia furcata • Chironomine Gen. sp. • • Anabolia nervosa • Chironomini Gen. sp. • • • Athripsodes albifrons • Chironomus acutiventris • • • Athripsodes chereus • Chironomus acutiventris • • • Athripsodes chereus • Chironomus nudiventris/agilis • • • Brachycentrus subnabilus • • Chironomus nudiventris/agilis • • • Ceracle alssimilis • Chironomus nudiventris/agilis • • • • • Ceracle alssimilis • Chironomus raprovis Sp. • • • • • Ceraclea sp. • Cladopelma viridulum gr. • • • • • • • • • • • • • • • • • • • • • • • • • <th>Taxon name</th> <th>Upper</th> <th>Middle</th> <th>Lower</th> <th>Tributary</th> <th>Taxon name</th> <th>Upper</th> <th>Middle</th> <th>Lower</th> <th>Tributary</th>	Taxon name	Upper	Middle	Lower	Tributary	Taxon name	Upper	Middle	Lower	Tributary
Anabolis nervosa Chironomini Gen. sp. Image: Chironomis acutiventris Image: Chironomis acutiventris/aguils Image: Chironomis plumosus Imag	Anabolia furcata	•				Chironominae Gen. sp.	•	•		
Athripsodes albifrons Chironomus acutiventris Image: Chironomus bernensis Athripsodes chereus Chironomus commutatus Image: Chironomus nudiventris/agilis Image: Chironomus ch	Anabolia nervosa	•				Chironomini Gen. sp.	•		•	•
Athripsodes bilineatus Chironomus bernensis Image: Chironomus nudiventris Image: Chironomus nudiventris/Sgillis Image: Chironomus nudiventris	Athripsodes albifrons	٠				Chironomus acutiventris	•	٠	٠	•
Athripsodes cinereus/ • • Chironomus commutatus • • Athripsodes cinereus/ Ineatureus • Chironomus nudiventris/agilis • • Brachycentrus maculatus • • Chironomus plumosus-Gr. • • Brachycentrus subnubilus • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <	Athripsodes bilineatus	•				Chironomus bernensis	•			•
Athripsodes cinereus/lineatus Chironomus nudiventris/agilis <t< td=""><td>Athripsodes cinereus</td><td>•</td><td></td><td></td><td>•</td><td>Chironomus commutatus</td><td></td><td>•</td><td></td><td></td></t<>	Athripsodes cinereus	•			•	Chironomus commutatus		•		
Athripsodes sp. • • Chironomus nudventris/agliis • Brachycentrus submubius • • Chironomus plumosus-Gr. • • Brachycentrus submubius • • Chironomus plumosus-Gr. • • Ceractea gis • • • • • • Ceractea gis • • • • • • • Chrunomus sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <t< td=""><td>Athripsodes cinereus/lineatus</td><td></td><td></td><td>•</td><td></td><td>Chironomus nudiventris</td><td></td><td>•</td><td></td><td></td></t<>	Athripsodes cinereus/lineatus			•		Chironomus nudiventris		•		
Brachycentrus maculatus Chironomus plumosus Chironomus plumosus-Gr. Ceradea dissimilis Chironomus riparius Chironomus riparius Chironomus sp. Chadapelma kindulum gr. Chironomus sp. Cladopelma kindulum gr. Cladotanytarsus mancus-Gr. Plydropsyche contubernalis Conchapelopia sp. Controneura scutellata Corynoneura scutellata Corynoneura scutellata Plydropsyche sp. Cricotopus lisoladius sp. Plydropsyche sp. Cricotopus lisoladius sp. Cricotopus lisoladius sp. Plydropsyche sp. Cricotopus cyclicateus/festivellus Plydropsyche sp. Cricotopus cyclicateus/festivellus Cricotopus cyclicateus/festivellus Cricotopus sp. Cricotop	Athripsodes sp.	•			•	Chironomus nudiventris/agilis		•		
Brachycentrus subnubius • • Chironomus ripanus • • Ceraclea gis. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <	Brachycentrus maculatus				•	Chironomus plumosus		•		•
Ceraclea dissimilis • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Brachycentrus subnubilus	•	•		•	Chironomus plumosus-Gr.				•
Cereade app. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <t< td=""><td>Ceraclea dissimilis</td><td>•</td><td></td><td></td><td>•</td><td>Chironomus riparius</td><td></td><td></td><td>•</td><td>٠</td></t<>	Ceraclea dissimilis	•			•	Chironomus riparius			•	٠
Cheumatopsyche lepida • Chrysopilus sp. • • Ecnomus tenellus • • Cladopelma viridulum gr. • • Halesus sp. • Cladotanytarsus mancus-Gr. • • • Hydropsyche contubernalis • • Cladotanytarsus sp. • • • Hydropsyche contubernalis • • Cladotanytarsus sp. • • • Hydropsyche contubernalis • • Cladotanytarsus sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <td>Ceraclea sp.</td> <td>•</td> <td></td> <td></td> <td>•</td> <td>Chironomus sp.</td> <td>•</td> <td>•</td> <td>•</td> <td>٠</td>	Ceraclea sp.	•			•	Chironomus sp.	•	•	•	٠
Ecnomus tenellus••Cladopelma laccophila-Gr.•Goera pilosa•Cladopelma virdulum gr.••Halesus sp.•Cladotanytarsus mancus-Gr.••Hydropsyche bulgaromanorum•••Cladotanytarsus mancus-Gr.•Hydropsyche contubernalis•••••Hydropsyche contubernalis•••••Hydropsyche exocellata•••••Hydropsyche incognita••••••Hydropsyche spelluddula-Gr.•••••••Hydropsyche spelluddula-Gr.•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	Cheumatopsyche lepida	•			•	Chrysopilus sp.	•			
Goera pilosa•Cladopelma viridulum gr.•Halesus sp.•Cladotanytarsus mancus-Gr.•Hydropsyche bulgaromanorum••Cladotanytarsus sp.•Hydropsyche contubernalis••Cladotanytarsus sp.•Hydropsyche incognita••Cladotanytarsus sp.•Hydropsyche incognita••Conchapelopia sp.•Hydropsyche pellucidula-Gr.••Corynoneura gr. coronata•Hydropsyche sp.•••••Hydropsyche sp.• <t< td=""><td>Ecnomus tenellus</td><td></td><td>٠</td><td></td><td>•</td><td>Cladopelma laccophila-Gr.</td><td></td><td>•</td><td></td><td></td></t<>	Ecnomus tenellus		٠		•	Cladopelma laccophila-Gr.		•		
Halesus sp. • Cladotanytarsus mancus-Gr. • Hydropsyche bulgaromanorum • • Cladotanytarsus sp. • Hydropsyche contubernalis • • Clinotanypus nervosus • Hydropsyche exocellata • • • • Hydropsyche incognita • • • • Hydropsyche incognita • • • • Hydropsyche sp. • • • • • Hydropsyche sp. • • • • • • Hydropsyche sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Goera pilosa	•				Cladopelma viridulum gr.				•
Hydropsyche bulgaromanorum • • Cladotanytarsus sp. • Hydropsyche contubernalis • • Clinotanypus nervosus • Hydropsyche exocellata • Conchapelopia sp. • • Hydropsyche incognita • Corynoneura gr. coronata • • Hydropsyche pellucidula-Gr. • • • • • Hydropsyche sp. • • • • • • • Hydropsyche sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <	Halesus sp.	٠				Cladotanytarsus mancus-Gr.				•
Hydropsyche contubernalis • Clinotanypus nervosus • Hydropsyche exocellata • Conchapelopia sp. • • Hydropsyche exocellata • Corynoneura gr. coronata • • Hydropsyche piellucidula-Gr. • Corynoneura scutellata • • Hydropsyche siltalai • • • • • Hydropsyche siltalai • • • • • • Hydropsyche siltalai • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <td>Hydropsyche bulgaromanorum</td> <td></td> <td>٠</td> <td>•</td> <td>•</td> <td>Cladotanytarsus sp.</td> <td></td> <td></td> <td></td> <td>٠</td>	Hydropsyche bulgaromanorum		٠	•	•	Cladotanytarsus sp.				٠
Hydropsyche exocellata Conchapelopia sp. Corynoneura gr. coronata Hydropsyche incognita Corynoneura gr. coronata Hydropsyche sp. Corynoneura scutellata Corynoneura scutellata-Gr. Hydropsyche sp. Cricotopus (Cricotopus) sp. Hydropsyche sp. Cricotopus (Icodatius) sp. Epidostoma hintum Cricotopus bicinctus Epidostoma hintum Cricotopus cylindraceus/festivellus Epidostoma hintum Cricotopus spinoteus sp. Mystacides sp. Cricotopus spinoteus-Gr. Mystacides sp. Cricotopus reflexionas Cricotopus spinoteus-Gr. Mystacides sp. Cricotopus spinoteus-Gr. Mystacides sp. Cricotopus reflexionas Cricotopus reflexionas Cricotopus spinoteus-Gr. Mystacides sp. Cricotopus reflexionas Cricotopus spinoteus-Gr. Mostacides sp. Cricotopus spinoteus-Gr. Cricotopus spinoteus-Gr. Cricotopus tremulus Cricotopus tremulus Cricotopus tremulus Cricotopus tremulus Cricotopus flaxomaculatus Cricotopus Crinotopus spinoteus Cricotopus Spinoteus Cricotopus Spinoteus Cricotopus Spinoteus Cricotopus Spinoteus Cricotopus Crinotadius Cricotopus Spinoteus<	Hydropsyche contubernalis	•			•	Clinotanypus nervosus				•
Hydropsyche incognita Corynoneura gr. coronata Hydropsyche pellucidula-Gr. Corynoneura scutellata Corynoneura scutellata Hydropsyche sp. Cricotopus (iscoladius) sp. Hydropsyche sp. Cricotopus (iscoladius) sp. Hydropsyche sp. Cricotopus (iscoladius) sp. Eptoceridae Gen. sp. Cricotopus (iscoladius) sp. Cricotopus (iscoladius) sp. Eptoceridae Gen. sp. Cricotopus (iscoladius) sp. Cricotopus (iscoladius) sp. Eptoceridae Gen. sp. Cricotopus cillidae Gen. sp. Cricotopus sp. Cricotopus sp. Cricotopus cillidae Gen. sp. Cricotopus cillidae Gen. sp. Cricotopus sp. Cricotopus sp. Cricotopus sp. Cricotopus remulus Cricotopus flavomaculatus Cricotopus sp. Cricotopus flavomaculatus Cricotopus cillidae Gen. sp. Cricotopus cillidae Gen. sp.	Hydropsyche exocellata				•	Conchapelopia sp.	•			•
Hydropsyche pellucidula-Gr. • Corynoneura scutellata • Hydropsyche sittalai • • • • Hydropsyche sp. • • • • • Hydropsyche sp. • • • • • • Hydroptila sp. • • • • • • • Hydroptila sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <t< td=""><td>Hydropsyche incognita</td><td></td><td></td><td></td><td>•</td><td>Corynoneura gr. coronata</td><td></td><td>•</td><td></td><td></td></t<>	Hydropsyche incognita				•	Corynoneura gr. coronata		•		
Hydropsyche siltalai • Corynoneura scutellata-Gr. • Hydropsyche sp. • • Cricotopus (Cricotopus) sp. • Hydropsyche sp. • • Cricotopus (Isociadius) sp. • Ithytrichia lamellaris • • Cricotopus bicinctus • • Lepidostoma hirtum • • Cricotopus bicinctus-Gr. • • Lepidostoma hirtum • • Cricotopus viindraceus/festivellus • • Mystacides azurea • • Cricotopus relucens • • Mystacides azurea • • Cricotopus rufiventris • • • Neureelipsis bimaculata • • • Cricotopus rufiventris • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <td< td=""><td>Hydropsyche pellucidula-Gr.</td><td>•</td><td></td><td></td><td></td><td>Corvnoneura scutellata</td><td></td><td></td><td>•</td><td></td></td<>	Hydropsyche pellucidula-Gr.	•				Corvnoneura scutellata			•	
Hydropsyche sp. • • Cricotopus (Cricotopus) sp. • Hydroptila sp. • • • Cricotopus (Isocladius) sp. • Ithytrichia lamellaris • • • • • Lepidostoma hirtum • • • • • Leptoceridae Gen. sp. • • • • • Mystacides azurea • • • • • • Neureclipsis bimaculata • • • • • • • • Oecetis notata • • Cricotopus relucens • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Hydropsyche siltalai	•				Corvnoneura scutellata-Gr.			•	
Throp DurberImage: Second	Hydropsyche sp.	•	•	•	•	Cricotopus (Cricotopus) sp.	1		•	
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Leptoceridae Gen. sp. Cricotopus cylindraceus/festivellus Mystacides azurea Cricotopus intersectus-Gr. Mystacides sp. Cricotopus relucens Cricotopus relucens Cricotopus sp. Cricotopus tremulus Cricotopus tremulus Cricotopus tremulus Cricotopus flavomaculatus Cricotopus flavomaculatus Cricotopus flavomaculatus Cricotopus flavomaculatus Cricotopus flavomaculatus Cricotopus-Gr. Gen. sp. Polycentropus flavomaculatus Criptochironomus obreptans Tinodes sp. Cryptochironomus obreptans Trichoptera Gen. sp. Cryptochironomus sp. Cricotopus sp. Criptendipes nervosus Cricotongies sp. Cricotongies sp. Dicrotendipes nervosus Cricotondipes sp. Cr	Lepidostoma hirtum	•			•	Cricotopus bicinctus-Gr.				•
Mystacides azurea • • Cricotopus intersectus-Gr. • Mystacides sp. • • Cricotopus rufiventris • • Neureclipsis bimaculata • • Cricotopus rufiventris • • Ocectis notata • • Cricotopus sp. • • • Oecetis notata • • Cricotopus sp. • • • • Oecetis notata • • Cricotopus sp. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Leptoceridae Gen. sp.				•	Cricotopus cylindraceus/festivellus	+			•
Mystacides sp. • Cricotopus relucens • Neureclipsis bimaculata • • Cricotopus rufiventris • Oecetis notata • • Cricotopus spl. • • Oecetis notata • • Cricotopus spl. • • • Oecetis sp. • • • • • • • Orthotrichia sp. • • Cricotopus tremulus • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • <t< td=""><td>Mystacides azurea</td><td>•</td><td></td><td></td><td>•</td><td>Cricotopus intersectus-Gr.</td><td>1</td><td></td><td>•</td><td></td></t<>	Mystacides azurea	•			•	Cricotopus intersectus-Gr.	1		•	
Neureclipsis bimaculata••Cricotopus rufiventris•Oecetis notata••••••Oecetis notata•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• </td <td>Mystacides sp.</td> <td>•</td> <td></td> <td></td> <td>•</td> <td>Cricotopus relucens</td> <td>•</td> <td></td> <td></td> <td></td>	Mystacides sp.	•			•	Cricotopus relucens	•			
Oecetis notataCricotopus sp.••Oecetis sp.•Cricotopus sp.•••Orthotrichia sp.••Cricotopus sylvestris-Gr.•••Polycentropodidae Gen. sp.••Cricotopus tremulus•••Polycentropus flavomaculatus••Cricotopus triannulatus•••Polycentropus flavomaculatus••Cricotopus triannulatus•••Psychomyia pusilla••Cricotopus/Orthocladius•••Rhyacophila sp.••Criptochironomus defectus•••Tinodes sp.••Cryptochironomus sp.•••Tinodes waeneri••Cryptochironomus sp.•••Trichoptera Gen. sp.••Demicryptochironomus sp.•••DIPTERA••Dicrotendipes nervosus••••Ablabesmyia longistyla•••Dicrotendipes sp.•••Anopheles sp.•••••••••Brillia langifurca•••••••••Cricotopus de Gen. sp.••••••••••Dicrotendiges notatus••••••••••••••<	Neureclipsis bimaculata		•	•	•	Cricotopus rufiventris	•			
Oecetis sp.Cricotopus sylvestris-Gr.••Orthotrichia sp.•Cricotopus tremulus••Polycentropodidae Gen. sp.••Cricotopus triannulatus•Polycentropus flavomaculatus••Cricotopus triannulatus•Polycentropus flavomaculatus••Cricotopus tricinctus•Polycentropus flavomaculatus••Cricotopus cf. Gen. sp.•Psychomyia pusilla••Cricotopus/Orthocladius••Rhyacophila sp.••Criptochironomus defectus••Tinodes sp.••Cryptochironomus obreptans••Tinodes waeneri••Cryptochironomus sp.••Trichoptera Gen. sp.••Demicryptochironomus sp.••DIPTERA••Dicrotendipes notatus•••Ablabesmyia sp.••••••Anopheles sp.••••••Antocnema sp.•••Dicrotendipes ritomus••Antocha sp.•••••••Brillia langifurca••••••Ceratopogonidae Gen. sp.••••••Ceratopogonidae Gen. sp.••••••Ceratopogonidae Gen. sp.•••••• <t< td=""><td>Oecetis notata</td><td></td><td></td><td>•</td><td></td><td>Cricotopus sp.</td><td>•</td><td>•</td><td>•</td><td>•</td></t<>	Oecetis notata			•		Cricotopus sp.	•	•	•	•
Orthotrichia sp.•Cricotopus tremulus•Polycentropodidae Gen. sp.••Cricotopus triannulatus•Polycentropus flavomaculatus••Cricotopus tricinctus•Psychomyia pusilla••Cricotopus-Gr. Gen. sp.•Rhyacophila sp.••Cricotopus/Orthocladius•Tinodes pallidulus••Cryptochironomus defectus•Tinodes sp.••Cryptochironomus obreptans•Tinodes waeneri••Cryptochironomus sp.•Trichoptera Gen. sp.••Demicryptochironomus sp.•DIPTERA•Dicrotendipes nervosus••Ablabesmyia sp.••Dicrotendipes sp.••Acanthocnema sp.••Dicrotendipes tritomus••Anopheles sp.••Dicrotendipes cryptication••Brillia flavifrons••Dichopodidae Gen. sp.••Brillia longifurca••Diclopopdidae Gen. sp.••Cratopogonidae Gen. sp.•••••Chironomidae Gen. sp.•••••Brillia longifurca••••••Chironomidae Gen. sp.••••••Chironomidae Gen. sp.••••••Chironomidae Gen. sp.••••• </td <td>Oecetis sp.</td> <td></td> <td></td> <td></td> <td>•</td> <td>Cricotopus sylvestris-Gr.</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td>	Oecetis sp.				•	Cricotopus sylvestris-Gr.	•	•	•	•
Polycentropodidae Gen. sp.•••Cricotopus triannulatus••Polycentropus flavomaculatus•Cricotopus tricinctus••••Psychomyia pusilla••Cricotopus-Gr. Gen. sp.•••Rhyacophila sp.•Cricotopus/Orthocladius••••Tinodes pallidulus••Cryptochironomus defectus••••Tinodes sp.••Cryptochironomus obreptans••••••Tinodes waeneri••Cryptochironomus sp.•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <t< td=""><td>Orthotrichia sp.</td><td></td><td></td><td>•</td><td></td><td>Cricotopus tremulus</td><td>•</td><td></td><td></td><td></td></t<>	Orthotrichia sp.			•		Cricotopus tremulus	•			
Polycentropus flavomaculatus•Cricotopus tricinctus•Psychomyia pusilla••Cricotopus tricinctus•Rhyacophila sp.••Cricotopus/Orthocladius•Tinodes pallidulus••Criptochironomus defectus•Tinodes sp.••Cryptochironomus obreptans••Tinodes waeneri••Cryptochironomus sp.•••Trichoptera Gen. sp.••Demicryptochironomus sp.•••DIPTERA•Dicrotendipes nervosus•••••Ablabesmyia longistyla•••Dicrotendipes sp.••••Anopheles sp.••Dicrotendipes tritomus••••••Antocha sp.•••Dicrotendipes tritomus•••••Brillia flavifrons•••Dicrotendipes sp.•••••Brillia longifurca•••Dichopodidae Gen. sp.•••••Critopogonidae Gen. sp.••••••••••Outper formation•••••••••••••••••••••••••••••••• <t< td=""><td>Polycentropodidae Gen. sp.</td><td>•</td><td></td><td></td><td>•</td><td>Cricotopus triannulatus</td><td></td><td></td><td>•</td><td></td></t<>	Polycentropodidae Gen. sp.	•			•	Cricotopus triannulatus			•	
Psychomyia pusilla•••••Rhyacophila sp.••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••	Polycentropus flavomaculatus	•				Cricotopus tricinctus	•			
Rhyacophila sp.•Cricotopus/Orthocladius•Tinodes pallidulus•Cryptochironomus defectus••Tinodes sp.•Cryptochironomus obreptans••Tinodes waeneri•Cryptochironomus sp.••Trichoptera Gen. sp.••Demicryptochironomus sp.••DIPTERADicrotendipes nervosus••••Ablabesmyia longistyla••Dicrotendipes notatus••Ablabesmyia sp.••Dicrotendipes sp.•••Acanthocnema sp.••Dicrotendipes tritomus•••Anopheles sp.••Diptera Gen. sp.•••Antocha sp.••Dicrotendipes tritomus•••Brillia longifurca••Dicleopodidae Gen. sp.•••Ceratopogonidae Gen. sp.••••••Chironomidae Gen. sp.•••••• <td>Psychomyja pusilla</td> <td>•</td> <td></td> <td></td> <td>•</td> <td>Cricotopus-Gr. Gen. sp.</td> <td></td> <td></td> <td>•</td> <td></td>	Psychomyja pusilla	•			•	Cricotopus-Gr. Gen. sp.			•	
Tinodes pallidulus•Cryptochironomus defectus••Tinodes sp.•Cryptochironomus obreptans•••Tinodes waeneri••Cryptochironomus sp.•••Trichoptera Gen. sp.••Demicryptochironomus sp.••••DIPTERADicrotendipes nervosus•••••••Ablabesmyia longistyla••Dicrotendipes notatus••••••Ablabesmyia sp.••Dicrotendipes sp.••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••<	Rhyacophila sp.	•				Cricotopus/Orthocladius	•			
Tinodes sp.•Cryptochironomus obreptans••Tinodes waeneri•Cryptochironomus sp.•••Trichoptera Gen. sp.••Demicryptochironomus sp.•••DIPTERADicrotendipes nervosus•••••Ablabesmyia longistyla••Dicrotendipes notatus•••Ablabesmyia sp.••Dicrotendipes sp.••••Acanthocnema sp.••Dicrotendipes tritomus••••Anopheles sp.••Diptera Gen. sp.•••••Brillia flavifrons••Dolichopodidae Gen. sp.•••••Ceratopogonidae Gen. sp.•••••••••Chironomidae Gen. sp.•••••••••Chironomidae Gen. sp.•••••••••	Tinodes pallidulus	•				Cryptochironomus defectus		•	•	•
Tinodes waeneri•Cryptochironomus sp.•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••<	Tinodes sp.	•				Cryptochironomus obreptans	•			•
Trichoptera Gen. sp.•Demicryptochironomus sp.•DIPTERADicrotendipes nervosus•••Ablabesmyia longistyla••Dicrotendipes notatus••Ablabesmyia sp.••Dicrotendipes sp.•••Acanthocnema sp.••Dicrotendipes tritomus•••Anopheles sp.••Diptera Gen. sp.•••Antocha sp.•Dickla sp.•••Brillia flavifrons••Dolichopodidae Gen. sp.••Brillia longifurca••••••Ceratopogonidae Gen. sp.••••••Chironomidae Gen. sp.••••••	Tinodes waeneri	•				Cryptochironomus sp.	•	•	•	•
DIPTERADicrotendipes nervosus••••Ablabesmyia longistyla••Dicrotendipes notatus••••Ablabesmyia sp.••Dicrotendipes sp.••••••Acanthocnema sp.••Dicrotendipes tritomus••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••• <td< td=""><td>Trichoptera Gen. sp.</td><td></td><td>•</td><td></td><td></td><td>Demicryptochironomus sp.</td><td></td><td></td><td>•</td><td></td></td<>	Trichoptera Gen. sp.		•			Demicryptochironomus sp.			•	
Ablabesmyia longistyla•Dicrotendipes notatus•Ablabesmyia sp.••Dicrotendipes sp.••Acanthocnema sp.••Dicrotendipes tritomus••Anopheles sp.••Diptera Gen. sp.••Antocha sp.••Dickla sp.••Brillia flavifrons••Dolichopodidae Gen. sp.••Brillia longifurca•••••Ceratopogonidae Gen. sp.•••••Chironomidae Gen. sp.•••••	DIPTERA					Dicrotendipes nervosus	•	•	•	•
Ablabesmyia sp. • Dicrotendipes sp. • • • Acanthocnema sp. • Dicrotendipes sp. • • • • Anopheles sp. • Diptera Gen. sp. • • • • • Antocha sp. • Dicrotendipes tritomus • • • • • • Brillia flavifrons • Dolichopodidae Gen. sp. • • • • • Brillia longifurca • • Eloeophila sp. • • • • Ceratopogonidae Gen. sp. • • • • • • • Chironomidae Gen. sp. • • • • • • •	Ablabesmvia longistyla				•	Dicrotendipes notatus	1		•	•
Acanthocnema sp. • Dicrotendipes tritomus • Anopheles sp. • Diptera Gen. sp. • Antocha sp. • Dixella sp. • Brillia flavifrons • Dolichopodidae Gen. sp. • Brillia longifurca • Eloeophila sp. • Ceratopogonidae Gen. sp. • • • Chironomidae Gen. sp. • • •	Ablabesmyia sp.				•	Dicrotendipes sp.	1	•	•	•
Anopheles sp. • Diptera Gen. sp. • Antocha sp. • Dixella sp. • Brillia flavifrons • Dolichopodidae Gen. sp. • Brillia longifurca • Eloeophila sp. • Ceratopogonidae Gen. sp. • • • Chironomidae Gen. sp. • • •	Acanthocnema sp.			•		Dicrotendipes tritomus	1		•	
Antocha sp. • Dixella sp. • Brillia flavifrons • Dolichopodidae Gen. sp. • Brillia longifurca • Eloeophila sp. • Ceratopogonidae Gen. sp. • • • Chironomidae Gen. sp. • • • Chironomidae Gen. sp. • • •	Anopheles sp.		1		•	Diptera Gen. sp.	<u>†</u>	•	1	<u> </u>
Brillia flavifrons • Dolichopodidae Gen. sp. • Brillia longifurca • Eloeophila sp. • Ceratopogonidae Gen. sp. • • • Chironomidae Gen. sp. • • • Objective • • • <t< td=""><td>Antocha sp.</td><td>•</td><td>1</td><td></td><td></td><td>Dixella sp.</td><td><u>†</u></td><td></td><td>•</td><td><u> </u></td></t<>	Antocha sp.	•	1			Dixella sp.	<u>†</u>		•	<u> </u>
Brillia longifurca • Eloeophila sp. • Ceratopogonidae Gen. sp. • • Empididae Gen. sp. Chironomidae Gen. sp. • • •	Brillia flavifrons		•			Dolichopodidae Gen. sp.	<u>†</u>	•		<u> </u>
Ceratopogonidae Gen. sp. • • • Empididae Gen. sp. • Chironomidae Gen. sp. • • • Endochironomus albipennis • •	Brillia longifurca	•				Eloeophila sp.	•			<u> </u>
Chironomidae Gen. sp. • • Endochironomus albipennis • • •	Ceratopogonidae Gen. sp.	•	•	•	•	Empididae Gen. sp.	<u>†</u>	1	1	•
	Chironomidae Gen. sp.	•			•	Endochironomus albipennis	1	•	•	•

Taxon name	Danube					Danube			_
	Upper	Middle	Lower	Tributary	Taxon name	Upper	Middle	Lower	Tributary
Endochironomus lepidus				•	Polypedilum laetum				•
Endochironomus sp.				•	Polypedilum laetum-Gr.			•	
Endochironomus tendens			٠	•	Polypedilum nubeculosum	•	٠	٠	٠
Glyptotendipes pallens		•			Polypedilum nubeculosum-Gr.			•	•
Glyptotendipes sp.				•	Polypedilum nubifer			•	
Harnischia sp.		•	•	•	Polypedilum pedestre	•			•
Kiefferulus tendipediformis			•	•	Polypedilum scalaenum		•	•	•
Limoniidae Gen. sp.		•			Polypedilum scalaenum-Gr.		•	•	•
Lipiniella araenicola		•			Polypedilum sp.		•	•	•
Lipsothrix sp.	•				Polypedilum tritum		•		
Macropelopia sp.	•				Polypedilum uncinatum		•		
Microchironomus tener		•	•	•	Potthastia gaedii	•	•		•
Microtendipes chloris-Gr.	•				Procladius (Holotanypus) sp.			•	•
Microtendipes pedellus		•		•	Procladius choreus			•	•
Microtendipes pedellus-Gr.				•	Procladius sp.	•	•	•	•
Microtendipes sp.	•				Prodiamesa olivacea	•	٠		•
Monodiamesa nitida	•				Rheocricotopus chalybeatus			•	•
Monodiamesa sp.	•				Rheocricotopus effusus				•
Monopelopia tenuicalcar	•				Rheocricotopus fuscipes			•	•
Nanocladius bicolor				•	Rheocricotopus sp.			•	
Nanocladius rectinervis		•			Rheopelopia sp.				•
Nanocladius sp.		•		•	Rheotanytarsus sp.	•			•
Neozavrelia sp.	•				Saetheria sp.	1			•
Orthocladiinae Gen. sp.	•		•	•	Scatophagidae Gen. sp.	1	•		
Orthocladiini COP	•				Setacera sp.			٠	
Orthocladius frigidus	•				Simuliidae Gen. sp.	1		•	
Orthocladius sp.	•		•	•	Simulium balcanicum	1	•		•
Parachironomus arcuatus		•	٠		Simulium colombaschense	•			
Parachironomus arcuatus-Gr.		•		•	Simulium erythrocephalum	•			•
Parachironomus frequens				•	Simulium lineatum	•			
Parachironomus sp.			•	•	Simulium ornatum-Gr.	1			•
Parachironomus varus				•	Simulium sp.	•		•	•
Paralauterborniella nigrohalteralis		•		•	Stempellina sp.		•		
Parametriocnemus stylatus	•				Stictochironomus sp.	•	•		•
Paratanytarsus dissimilis			•	•	Stictochironomus sticticus		•		
Paratanytarsus sp.	•		•	•	Symposiocladius lignicola				•
Paratendipes albimanus	•				Synorthocladius semivirens	•			
Paratrichocladius rufiventris				•	Tabanidae Gen. sp.				•
Paratrichocladius sp.	•				Tanypodinae Gen. sp.	•		•	•
Phaenopsectra flavipes				•	Tanypus sp.			•	•
Phaenopsectra sp.			•	•	Tanytarsini Gen. sp.	•			•
Polypedilum aegyptium	•				Tanytarsus sp.	•	•	•	•
Polypedilum albicorne				•	Telmatopelopia sp.			•	
Polypedilum bicrenatum		•	•	•	Thienemannimyia sp.				•
Polypedilum bicrenatum-Gr.			•		Tvetenia calvescens	•			
Polypedilum convictum			•		Tvetenia sp.	•			
Polypedilum cultellatum	•			•	Virgatanytarsus sp.	•			•
Polypedilum cultellatum/tritum			•		Zavrelia sp.				•