

Research of water macroinvertebrates of characteristic water bodies and streams of middle and upper reach of the Ipel' River basin (Slovakia) in terms of principles of Natura 2000 and WFD

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- accurately estimate the biodiversity of water macroinvertebrate communities and its changes within Slovak part of the Ipeľ River catchment

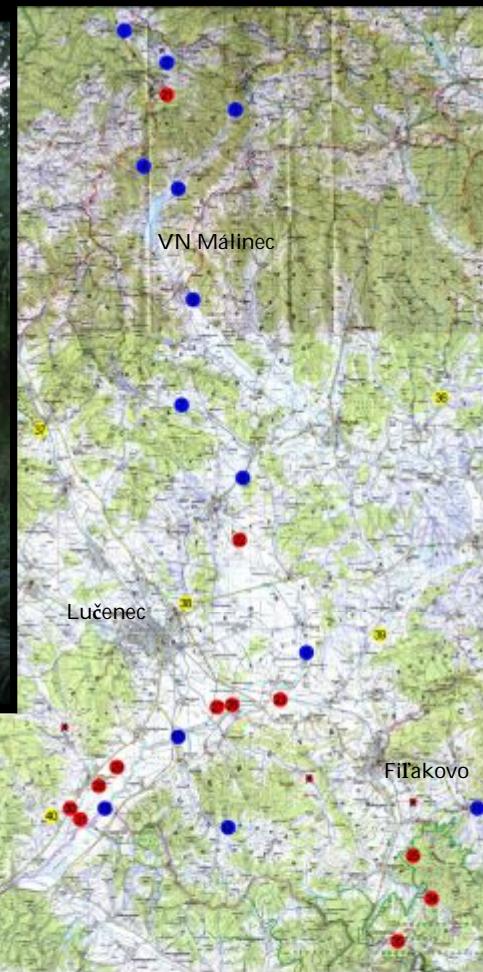
WFD localities

- localities for „WFD“different stream types according to Slovak procedure of assessment of the ecological status of streams
- main stream channel of Ipeľ River (considering expected changes in benthic communities in relation to altitude); some of tributaries of the Ipeľ River in order to cover wide range of stream types in the Ipeľ River catchment
- 5 localities as inter-calibration sites



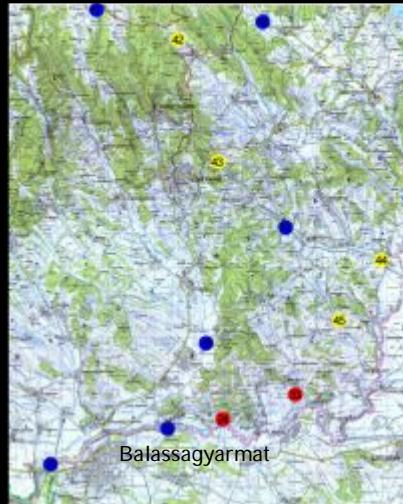
NATURA 2000

- widest possible range of aquatic biotopes within Ipeľ River catchment
- stagnant waterbodies as well as various types of flowing waters
- in NATURA 2000 areas



Invasive species localities

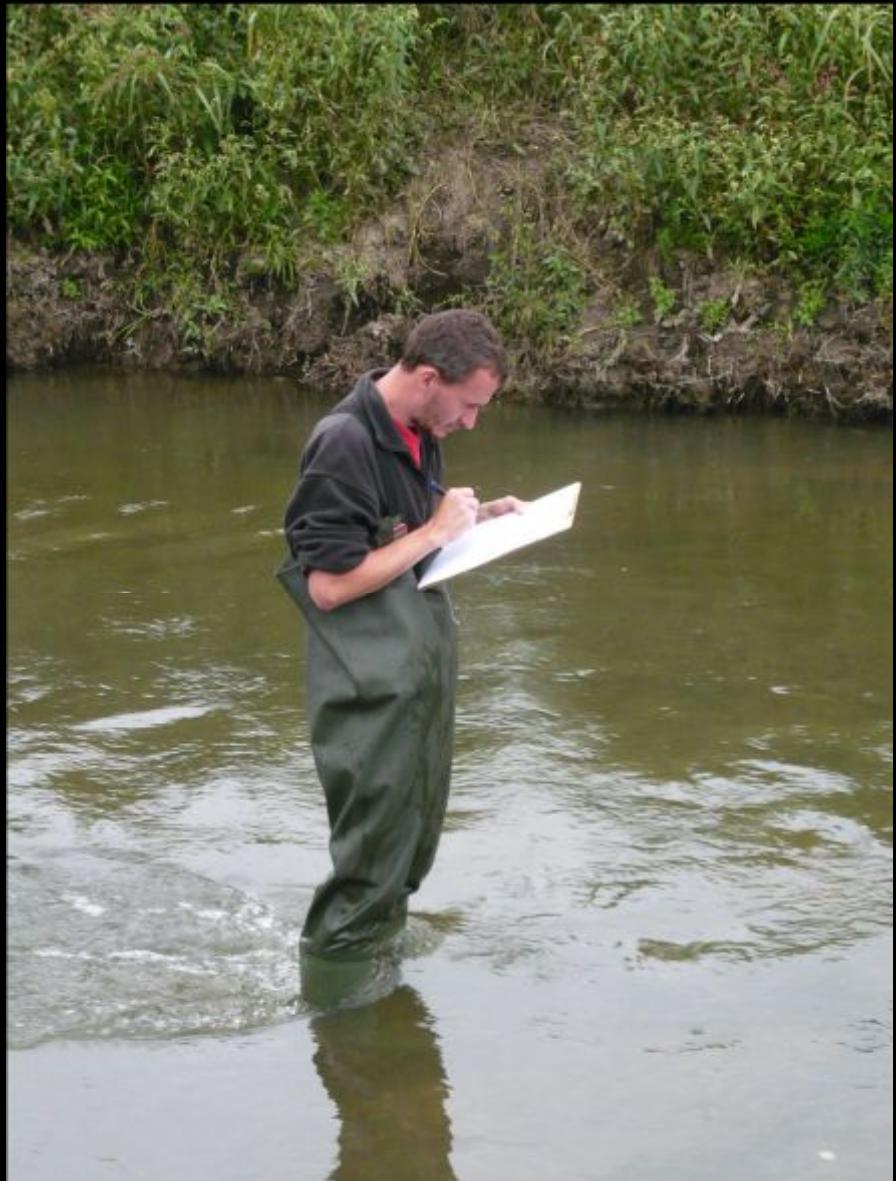
- corridors of extension of these species
- estuaries of tributaries of Ipeľ River
- areas of potential occurrence of target invasive species



- WFD
- NATURA 2000
- Invasive

WFD localities

- “Intercalibration localities” (5 sites) - STAR-AQEM method adapted and modified by Slovak national conditions (Šporka et al. 2009)
- multihabitat sampling procedure; 20 samples were taken from each sampled reach of the stream using modified “Surber net” (mesh size 500µm, frame size 25x25 cm)
- remaining localities - modified Hungarian procedure (Juhász et al. 2009) - 250m long reaches divided into 3 sections, 5 samples from section; modified “Surber net”



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NATURA 2000

- standard qualitative sampling - 'kick and sweep' technique
- widest possible range of habitats was sampled
- running watercourses - modified Hungarian procedure for ecological status assessment
- terrestrial stages were taken for more precise determination of some species (e.g. Odonata)



Invasive species localities

- qualitative sampling procedure using benthic net
- 200 m stretch of stream was sampled - different habitats, emphasis on habitats preferred by individual invasive species
- individual picking sampling



- 298 taxa of macroinvertebrates of selected groups – Mollusca (29 taxa), Hirudinea (12 taxa), Crustacea (6 taxa), Ephemeroptera (57 taxa), Odonata (22 taxa), Plecoptera (42 taxa), Heteroptera (13 taxa), Coleoptera (43 taxa) and Trichoptera (65 taxa)

sampling site	number of taxa	sampling site	number of taxa
IPE_1053	23	NATURA_21	20
IPE_1054	55	NATURA_22	3
IPE_1055	61	NATURA_23	9
CHO_1056	37	NATURA_24	6
IPE_1057	71	NATURA_25	17
IPE_1058	33	NATURA_26	24
IPE_1059	37	NATURA_27	18
IPE_1060	38	NATURA_28	15
IPE_1061	38	NATURA_29	19
IPE_1062	35	NATURA_30	12
ČAM_1063	22	NATURA_31	8
MUČ_1064	42	NATURA_32	35
IPE_1065	36	NATURA_33	18
STA_1066	26	NATURA_34	36
STR_1067	40	NATURA_35	29
TIS_1068	67		
KRT_1069	57		
KRT_1070	36		
IPE_1071	40		
IPE_1072	50		

	IPE_1053	IPE_1054	IPE_1055	CHO_1056	IPE_1057	IPE_1058	IPE_1059	IPE_1060	IPE_1061	IPE_1062	ČAM_1063	MUČ_1064	IPE_1065	STA_1066	STR_1067	TIS_1068	KRT_1069	KRT_1070	IPE_1071	IPE_1072	NATURA_21	NATURA_22	NATURA_23	NATURA_24	NATURA_25	NATURA_26	NATURA_27	NATURA_28	NATURA_29	NATURA_30	NATURA_31	NATURA_32	NATURA_33	NATURA_34	NATURA_35
Mollusca																																			
<i>Ancylus fluvialis</i> O. F. MÜLLER, 1774																																			
<i>Anisus spirorbis</i> (LINNAEUS, 1758)	x					x																									x	x			
<i>Bithynia tentaculata</i> (LINNAEUS, 1758)							x																								x	x			
<i>Bythinella austriaca</i> s.l. (FRAUENFELD, 1857)	x																																		
<i>Ferrissia fragilis</i> (TRYON, 1863)																															x	x			
<i>Galba truncatula</i> (O. F. MÜLLER, 1774)							x	x			x								x	x															
<i>Gyraulus albus</i> (O. F. MÜLLER, 1774)																															x	x			
<i>Gyraulus laevis</i> (ALDER, 1838)																															x	x			
<i>Gyraulus laevis/parus</i>																	x	x	x																
<i>Hippeutis complanatus</i> (LINNAEUS, 1758)																	x	x	x											x	x				
<i>Lymnaea stagnalis</i> (LINNAEUS, 1758)																			x	x											x	x			
<i>Musculium lacustre</i> (O. F. MÜLLER, 1774)																	x	x	x											x	x				
<i>Physella acuta</i> (DRAPARNAUD, 1805)																	x	x	x											x	x				
<i>Pisidium amnicum</i> (O. F. MÜLLER, 1774)																	x	x	x											x	x				
<i>Pisidium casertanum</i> (POLI, 1791)	x	x				x	x		x		x						x	x	x										x	x					
<i>Pisidium milium</i> HELD, 1836																	x	x	x											x	x				
<i>Pisidium personatum</i> MALM, 1855							x										x	x	x											x	x				
<i>Pisidium subtruncatum</i> MALM, 1855							x																								x	x			
<i>Planorbarius corneus</i> (LINNAEUS, 1758)																			x	x										x	x				
<i>Planorbis planorbis</i> (LINNAEUS, 1758)																		x	x	x										x	x				
<i>Radix auricularia</i> (LINNAEUS, 1758)																		x	x	x										x	x				
<i>Radix ovata</i> (DRAPARNAUD, 1805)																	x	x	x											x	x				
<i>Radix peregra</i> (O. F. MÜLLER, 1774)									x		x		x				x	x	x										x	x					
<i>Segmentina nitida</i> (O. F. MÜLLER, 1774)							x										x	x	x											x	x				
<i>Sphaerium corneum</i> s.l. (LINNAEUS, 1758)							x										x	x	x											x	x				
<i>Stagnicola palustris</i> O. F. MÜLLER, 1774								x				x					x	x	x											x	x				
<i>Theodoxus danubialis</i> (C. PFEIFFER, 1828)									x								x	x	x											x	x				
<i>Viviparus contectus</i> (MILLET, 1813)							x										x	x	x											x	x				
<i>Unio crassus</i> PHILIPSSON, 1788								x				x					x	x	x											x	x				

	IPE_1053	IPE_1054	IPE_1055	CHO_1056	IPE_1057	IPE_1058	IPE_1059	IPE_1060	IPE_1061	IPE_1062	ČAM_1063	MUČ_1064	IPE_1065	STA_1066	STR_1067	TIS_1068	KRT_1069	KRT_1070	IPE_1071	IPE_1072	NATURA_21	NATURA_22	NATURA_23	NATURA_24	NATURA_25	NATURA_26	NATURA_27	NATURA_28	NATURA_29	NATURA_30	NATURA_31	NATURA_32	NATURA_33	NATURA_34	NATURA_35
Hirudinea																																			
<i>Erpobdella octoculata</i> (LINNAEUS, 1758)																																			
<i>Erpobdella vilnensis</i> (LISKIEWICZ, 1925)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Hemiclepsis marginata</i> (O. F. MÜLLER, 1774)																x																			
<i>Glossiphonia concolor</i> (APATHY, 1883)							x	x	x	x																									
<i>Erpobdella nigricollis</i> (BRANDES, 1900)						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Helobdella stagnalis</i> (LINNAEUS, 1758)							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Glossiphonia complanata</i> (LINNAEUS, 1758)						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Piscicola geometra</i> (LINNAEUS, 1758)							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Glossiphonia nebulosa</i> KALBE, 1964								x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Haemopis sanguisuga</i> (LINNAEUS, 1758)	x					x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Trocheta cylindrica</i> ÖRLEY, 1886														x																	x				
<i>Cystobranchus fasciatus</i> (KOLLAR, 1842)																x																			
Crustacea																																			
<i>Gammarus fossarum</i> KOCH, 1836	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Gammarus balcanicus</i> SCHÄFERNA, 1922	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Gammarus roeselii</i> GERVAIS, 1835																x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Gammarus</i> spp.juv	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Asellus aquaticus</i> (LINNAEUS, 1758)	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Astacus astacus</i> (LINNAEUS, 1758)						x							x			x			x			x	x	x	x	x	x	x	x	x	x				

	IPE_1053	IPE_1054	IPE_1055	CHO_1056	IPE_1057	IPE_1058	IPE_1059	IPE_1060	IPE_1061	IPE_1062	ČAM_1063	MUC_1064	IPE_1065	STA_1066	STR_1067	TIS_1068	KRT_1069	KRT_1070	IPE_1071	IPE_1072	NATURA_21	NATURA_22	NATURA_23	NATURA_24	NATURA_25	NATURA_26	NATURA_27	NATURA_28	NATURA_29	NATURA_30	NATURA_31	NATURA_32	NATURA_33	NATURA_34	NATURA_35
Ephemeroptera																																			
<i>Baetis alpinus</i> (PICTET, 1843)	x	x	x	x																		x													
<i>Baetis buceratus</i> EATON, 1870																																			
<i>Baetis fuscatus</i> (LINNAEUS, 1761)							x	x	x	x	x				x	x	x	x	x	x															
<i>Baetis melanonyx</i> PICTET, 1843	x	x																																	
<i>Baetis micinus</i> (LINNAEUS, 1758)			x	x																	x														
<i>Baetis pentaphlebodes</i> UJHELYI, 1966						x				x						x	x	x	x	x						x									
<i>Baetis rhodani</i> (PICTET, 1843)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Baetis scambus</i> EATON, 1870							x									x																			
<i>Baetis tracheatus</i> KEFFERMÜLLER ET MACHEL, 1967						x					x					x					x														
<i>Baetis vernus</i> CURTIS, 1834	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Baetis</i> spp. juv.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Caenis beskidensis</i> SOWA, 1973																										x									
<i>Caenis horaria</i> (LINNAEUS, 1758)																																			
<i>Caenis lactea</i> (BURMEISTER, 1839)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Caenis luctuosa</i> (BURMEISTER, 1839)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Caenis macrura</i> STEPHENS, 1835																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Caenis pseudorivulorum</i> KEFFERMÜLLER, 1960																																			
<i>Caenis rivulorum</i> EATON, 1884																					x														
<i>Caenis robusta</i> EATON, 1884																					x														
<i>Centroptilum luteolum</i> (MÜLLER, 1776)						x										x	x	x	x	x	x										x				
<i>Centroptilum pennulum</i> EATON, 1870																x		x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Cloeon dipterum</i> (LINNAEUS, 1761)		x				x					x					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Ecdyonurus aurantiacus</i> BÜRMEISTER, 1839											x					x		x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Ecdyonurus</i> cf. <i>carpathicus vitoshensis</i> JACOB ET BRAASCH, 1984																					x										x				
<i>Ecdyonurus</i> cf. <i>parahelveticus</i> HEFTI ET AL. 1986																					x														
<i>Ecdyonurus macani</i> THOMAS & SOWA, 1970	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Ecdyonurus</i> spp. juv.	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Electrogena affinis</i> (EATON, 1883)							x									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Electrogena samalorum</i> (LANDA & SOLDÁN, 1982)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Electrogena ujhelyi</i> (SOWA, 1981)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Electrogena</i> spp. juv.																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Epeorus assimilis</i> (EATON, 1871)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Ephemera danica</i> MÜLLER, 1764		x														x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Ephemera lineata</i> EATON, 1870																x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Ephemerella ignita</i> (PODA, 1761)		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Ephemerella notata</i> EATON, 1887						x										x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Ephemerella mucronata</i> (BENGSSON, 1909)						x																													
<i>Ephoron virgo</i> (OLIVIER, 1791)										x										x															
<i>Habroleptoides confusa</i> SARTORI ET JACOB, 1986	x	x	x	x	x											x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Habrophlebia fusca</i> (CURTIS, 1834)											x					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Habrophlebia lauta</i> EATON, 1884						x										x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Heptagenia coeruleans</i> ROSTOCK, 1877							x				x					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Heptagenia flava</i> ROSTOCK, 1877						x	x			x						x				x				x											
<i>Heptagenia longicauda</i> (STEPHENS, 1836)							x			x						x				x				x											
<i>Heptagenia sulphurea</i> (MÜLLER, 1776)						x			x							x			x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Heptagenia</i> spp. juv.						x			x							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				

Ephemeroptera

<i>Heptageniidae</i> gen. spp. indet.	PE_1053	PE_1054	PE_1055	CHO_1056	PE_1057	PE_1058	PE_1059	PE_1060	PE_1061	PE_1062	ČAM_1063	MUČ_1064	PE_1065	STA_1066	STR_1067	TIS_1068	KRT_1069	KRT_1070	PE_1071	PE_1072	NATURA_21	NATURA_22	NATURA_23	NATURA_24	NATURA_25	NATURA_26	NATURA_27	NATURA_28	NATURA_29	NATURA_30	NATURA_31	NATURA_32	NATURA_33	NATURA_34	NATURA_35
<i>Paraleptophlebia submarginata</i> (STEPHENS, 1835)	x						x							x	x	x	x													x	x				
<i>Paraleptophlebia</i> spp. juv.																																			
<i>Potamanthus luteus</i> (LINNAEUS, 1767)															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Procloeon bifidum</i> (BENGSSON, 1912)														x			x																		
<i>Rhithrogena carpatoalpina</i> (KŁONOWSKA, 1987)	x		x												x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Rhithrogena iridina</i> (KOLENATI, 1859)	x	x	x	x			x	x															x												
<i>Rhithrogena savoiensis</i> ALBA-TERCEDOR ET SOWA, 1987							x																												
<i>Rhithrogena semicolorata</i> (CURTIS, 1834)	x			x		x	x	x	x																										
<i>Rhithrogena</i> spp. juv.	x		x	x	x	x										x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Torleya major</i> (KLAPÁLEK, 1905)															x																				

Odonata

<i>Anax imperator</i> LEACH, 1815																									x	x								
<i>Anax</i> spp.juv.															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Calopteryx splendens</i> (HARRIS, 1782)															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Calopteryx</i> spp. juv.															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Coenagrion puella/pulchellum</i>																									x	x	x	x	x	x	x	x	x	
<i>Coenagrionidae</i> spp. juv.																									x	x	x	x	x	x	x	x	x	
<i>Corduliidae</i> spp. juv																									x	x	x	x	x	x	x	x	x	
<i>Enallagma cyathigerum</i> (CHARPENTIER, 1840)																									x	x	x	x	x	x	x	x	x	
<i>Erythromma najas</i> (HANSEMANN, 1823)															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
<i>Gomphus vulgatissimus</i> (LINNAEUS, 1758)															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
<i>Gomphus flavipes</i> (CHARPENTIER, 1825)																									x	x	x	x	x	x	x	x	x	
<i>Gomphus</i> spp. juv.																									x	x	x	x	x	x	x	x	x	
<i>Ischnura elegans</i> (VANDER LINDEN, 1823)																									x	x	x	x	x	x	x	x	x	
<i>Ischnura pumilio</i> (CHARPENTIER, 1825)																									x	x	x	x	x	x	x	x	x	
<i>Onychogomphus forcipatus</i> (LINNAEUS, 1758)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Ophiogomphus cecilia</i> juv./ <i>Onychogomphus forcipatus</i>															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Orthetrum cancellatum</i> (LINNAEUS, 1758)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Platycnemis pennipes</i> (PALLAS, 1771)															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Pyrhosoma/Ischnura</i>																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Somatochlora metallica</i> (VANDER LINDEN, 1825)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Sympetrum vulgatum</i> (LINNAEUS, 1758)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Zygoptera</i> spp.juv.															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

Plecoptera

- Perla* sp. juv.
Siphonoperla neglecta (ROSTOCK, 1881)
Siphonoperla taurica (PICTET, 1841)
Siphonoperla torrentium (PICTET, 1841)
Siphonoperla sp.

	IPE_1053	IPE_1054	IPE_1055	CHO_1056	IPE_1057	IPE_1058	IPE_1059	IPE_1060	IPE_1061	IPE_1062	ČAM_1063	MUČ_1064	IPE_1065	STA_1066	STR_1067	TIS_1068	KRT_1069	KRT_1070	IPE_1071	IPE_1072	NATURA_21	NATURA_22	NATURA_23	NATURA_24	NATURA_25	NATURA_26	NATURA_27	NATURA_28	NATURA_29	NATURA_30	NATURA_31	NATURA_32	NATURA_33	NATURA_34	NATURA_35
<i>Perla</i> sp. juv.	x	x		x																															
<i>Siphonoperla neglecta</i> (ROSTOCK, 1881)	x						x	x																											
<i>Siphonoperla taurica</i> (PICTET, 1841)				x	x																														
<i>Siphonoperla torrentium</i> (PICTET, 1841)			x														x																		
<i>Siphonoperla</i> sp.	x		x																																
Heteroptera																																			
<i>Aphelocheirus aestivalis</i> FABRICIUS, 1803							x								x			x	x																
<i>Aquarius paludum</i> FABRICIUS, 1794																												x							
<i>Corixinae</i> gen. sp. juv.																												x							
<i>Cymatia coleoptrata</i> FABRICIUS, 1776																												x							
<i>Gerris lacustris</i> LINNÉ, 1758																												x							
<i>Gerris</i> spp. juv.																												x							
<i>Ilyocoris cimicoides</i> LINNÉ, 1758																			x																
<i>Micronecta scholtzi</i> FIEBER, 1860							x							x			x																		
<i>Nepa cinerea</i> LINNÉ, 1758																		x		x	x	x				x									
<i>Notonecta glauca</i> LINNÉ, 1758																	x			x	x	x	x												
<i>Notonecta viridis</i> DELCOURT, 1909														x								x													
<i>Ranatra linearis</i> LINNÉ, 1758																	x																		
<i>Sigara lateralis</i> LEACH, 1818																x						x													
Coleoptera																	x			x								x		x					
<i>Pomatinus substriatus</i> (MÜLLER, 1806)																		x																	
<i>Colymbetes fuscus</i> (LINNEAUS, 1758)																	x																		
<i>Agabus bipustulatus</i> (LINNEAUS, 1767)															x													x							
<i>Dytiscus marginalis</i> (LINNEAUS, 1759)																		x																	
<i>Graptodytes pictus</i> (FABRICIUS, 1787)																			x																
<i>Hydaticus</i> sp.																			x																
<i>Hydroglyphus geminus</i> (FABRICIUS, 1792)														x							x	x					x								
<i>Hydroporus palustris</i> (LINNEAUS, 1761)																x						x													
<i>Hydroporus</i> sp. (L)																x							x												
<i>Hyphydrus ovatus</i> (LINNEAUS, 1761)																	x					x													
<i>Laccophilus hyalinus</i> (De Geer, 1774)																		x										x							
<i>Laccophilus minutus</i> (LINNEAUS, 1758)																	x			x	x						x								
<i>Platambus maculatus</i> (LINNEAUS, 1758)											x			x		x	x				x							x							
<i>Rhantus suturalis</i> (MAC LEAY, 1825)										x				x													x								
<i>Elmis aenea</i> (MÜLLER, 1806)	x	x	x		x																														
<i>Elmis latreillei</i> BEDEL, 1878	x																																		
<i>Elmis maugetii</i> LATREILLE, 1798						x								x	x	x					x						x			x	x	x			
<i>Elmis</i> sp. (L)	x	x												x		x					x														
<i>Esolus parallelepipedus</i> (MÜLLER, 1806)															x																				

Coleoptera

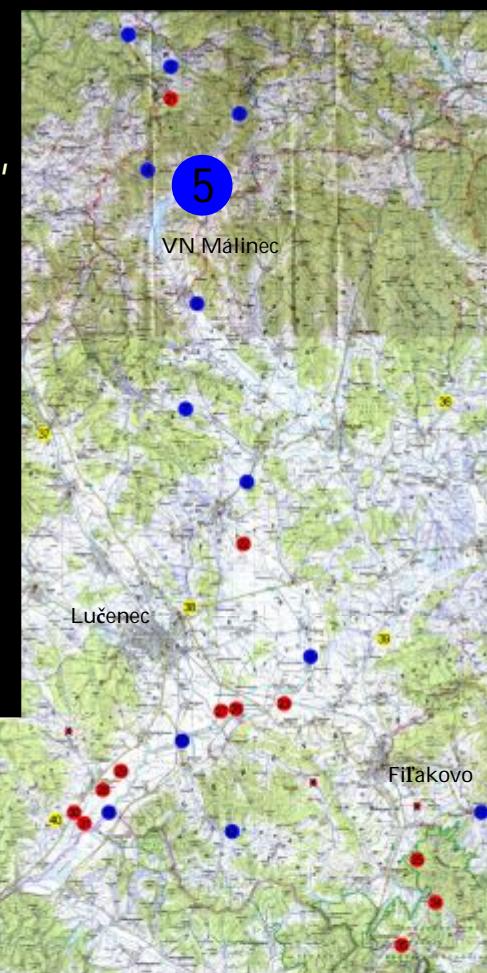
<i>Esolus</i> sp. (L)	IPE_1053	IPE_1054	IPE_1055	CHO_1056	IPE_1057	IPE_1058	IPE_1059	IPE_1060	IPE_1061	IPE_1062	ČAM_1063	MUČ_1064	IPE_1065	STA_1066	STR_1067	TIS_1068	KRT_1069	KRT_1070	IPE_1071	IPE_1072	NATURA_21	NATURA_22	NATURA_23	NATURA_24	NATURA_25	NATURA_26	NATURA_27	NATURA_28	NATURA_29	NATURA_30	NATURA_31	NATURA_32	NATURA_33	NATURA_34	NATURA_35					
<i>Limnius perrisi</i> (DUFOUR, 1843)	x	x	x	x								x			x	x					x																			
<i>Limnius volckmari</i> (PANZER, 1793)			x			x									x	x																x								
<i>Limnius</i> sp. (L)	x	x	x	x														x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Macronychus quadrituberculatus</i> MÜLLER, 1806																																								
<i>Oulimnius tuberculatus</i> (MÜLLER, 1806)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Orecochilus villosus</i> (MÜLLER, 1776)																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Gyrinus</i> sp.																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Helophorus</i> sp.																																				x				
<i>Hydraena dentipes</i> GERMAR, 1842	x	x															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Hydraena excisa</i> KIESENWETTER, 1849																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Hydraena gracilis</i> GERMAR, 1824	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Hydraena melas</i> DALLA TORRE, 1877	x																x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Hydraena riparia</i> KUGELANN, 1794	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Hydraena saga</i> D'ORCHYMTONT, 1930	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
<i>Hydraena</i> sp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Limnebius</i> sp.																																				x				
<i>Ochthebius</i> sp.																																				x	x	x		
<i>Enochrus</i> sp.																																				x				
<i>Hydrochara caraboides</i> (LINNEAUS, 1758)																																x	x	x	x	x	x			
<i>Laccobius</i> sp.																																x	x	x	x	x	x			
<i>Noterus clavicornis</i> (DE GEER, 1774)																															x	x	x	x	x	x				
<i>Noterus crassicornis</i> (MÜLLER, 1776)																															x	x	x	x	x	x				
<i>Eloides</i> sp. (L)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
Trichoptera																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
<i>Rhyacophilà cf. fasciata</i> HAGEN, 1859							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Rhyacophilà cf. nubila</i> (ZETTERSTEDT, 1840)	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Rhyacophilà cf. oblitterata</i> MCLACHLAN, 1863	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Rhyacophilà philopotamoides</i> MCLACHLAN, 1880	x																																							
<i>Rhyacophilà cf. Polonica</i> MCLACHLAN, 1879							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Rhyacophilà tristis</i> PICTET, 1835	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Rhyacophilà cf. vulgaris</i> PICTET, 1834																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
<i>Rhyacophilà s str.</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Glossosoma intermedium</i> (KLAPÁLEK, 1892)							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
<i>Philopotamus ludificatus</i> MCLACHLAN, 1878	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Philopotamus montanus</i> (DONOVAN, 1813)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
<i>Philopotamus</i> sp. juv.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					

Trichoptera

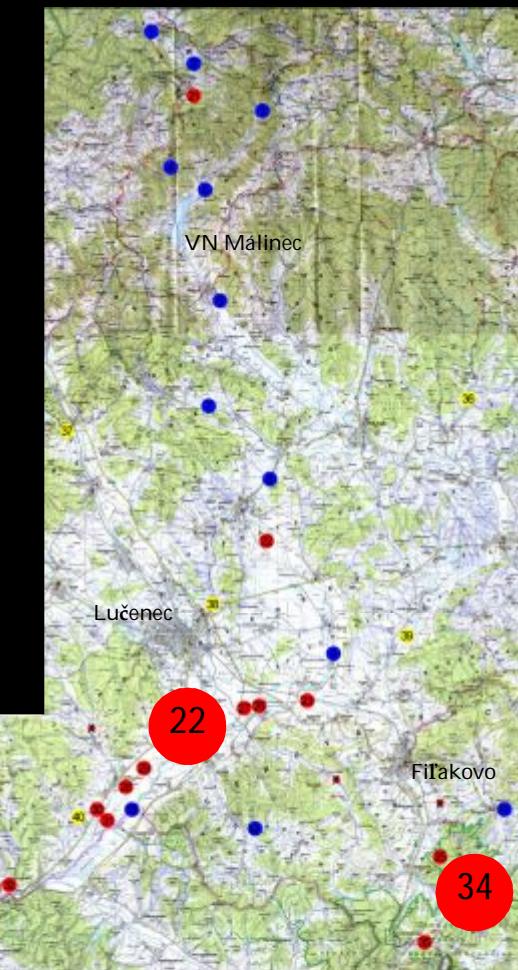
	IPE_1053	IPE_1054	IPE_1055	CHO_1056	IPE_1057	IPE_1058	IPE_1059	IPE_1060	IPE_1061	IPE_1062	ČAM_1063	MUČ_1064	IPE_1065	STA_1066	STR_1067	TIS_1068	KRT_1069	KRT_1070	IPE_1071	IPE_1072	NATURA_21	NATURA_22	NATURA_23	NATURA_24	NATURA_25	NATURA_26	NATURA_27	NATURA_28	NATURA_29	NATURA_30	NATURA_31	NATURA_32	NATURA_33	NATURA_34	NATURA_35
<i>Cheumatopsyche lepida</i> (PICTET, 1834)																x x																			
<i>Hydropsyche angustipennis</i> (CURTIS, 1834)																x x	x x x x	x x x x	x x x x	x x x x	x x x x										x				
<i>Hydropsyche bulbifera</i> MCLACHLAN, 1878	x x x x x															x x x x	x x x x	x x x x	x x x x	x x x x	x x x x									x					
<i>Hydropsyche contubernalis</i> MCLACHLAN, 1865																x						x x													
<i>Hydropsyche exocellata</i> DUFOUR, 1841																x x						x x													
<i>Hydropsyche fulvipes</i> (CURTIS, 1834)																x						x x								x					
<i>Hydropsyche instabilis</i> (CURTIS, 1834)	x x x															x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x														
<i>Hydropsyche incognita</i> PITTSCH, 1993																x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x														
<i>Hydropsyche modesta</i> NAVÁS, 1925																x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x														
<i>Hydropsyche pellucidula</i> (CURTIS, 1834)																x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x														
<i>Hydropsyche pellucidula/incipnita</i>	x x															x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x														
<i>Hydropsyche saxonica</i> MCLACHLAN, 1884	x x x															x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x							x	x	x	x				
<i>Hydropsyche</i> spp. juv.	x x x															x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x							x	x	x	x				
<i>Cyrinus trimaculatus</i> (CURTIS, 1834)																x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x														
<i>Plectrocnemia conspersa</i> (CURTIS, 1834)	x															x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x						x			x				
<i>Polycentropus flavomaculatus</i> (PICTET, 1834)																x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x														
<i>Polycentropus</i> sp.																x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x														
<i>Tinodes</i> cf. <i>unicolor</i> (PICTET, 1834)		x																																	
<i>Oligostomis reticulata</i> (LINNEAUS, 1761)																													x						
<i>Brachycentrus montanus</i> Klapálek, 1892	x																																		
<i>Brachycentrus subnubilus</i> CURTIS, 1834																					x x														
<i>Micrasema minimum</i> MCLACHLAN, 1876	x																				x x														
<i>Mystacides azurea</i> (LINNAEUS, 1761)																x x												x							
<i>Mystacides longicornis/nigra</i>																x x					x						x			x					
<i>Beraea</i> cf. <i>maurus</i> (CURTIS, 1834)																													x			x			
<i>Beraea pullata</i> (CURTIS, 1834)																													x			x			
<i>Beraeodes minutus</i> (LINNEAUS, 1761)																													x			x			
<i>Odontocerum albicorne</i> (SCOPOLI, 1763)	x x x x x															x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x	x	x	x	x	x	x	x	x	x	x			
<i>Anabolia furcata</i> BRAUER, 1857																x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x	x	x	x	x	x	x	x	x	x	x			
<i>Drusus biguttatus</i> (PICTET, 1834)	x															x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x	x	x	x	x	x	x	x	x	x	x			
<i>Ecclisopteryx madida</i> (MCLACHLAN, 1867)		x														x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x x x x x x	x	x	x	x	x	x	x	x	x	x	x			
<i>Annitella obscurata</i> (MCLACHLAN, 1876)			x																																
<i>Chaetopteryx villosa/fusca</i>	x	x	x x x x x													x x		x		x		x		x		x		x		x	x	x	x		
<i>Limnephilus affinis</i> CURTIS, 1834			x x x x x													x		x		x		x		x		x		x		x	x	x	x		
<i>Limnephilus rhombicus</i> (LINNEAUS, 1758)				x												x		x		x		x		x		x		x		x	x	x	x		
<i>Glyphotaelius pellucidus</i> (RETZIUS, 1783)					x												x		x		x		x		x		x		x	x	x	x	x		

Trichoptera																									
Chaetopterygini indet. juv.																									
Limnephilinae indet juv.	x	x			x		x	x		x	x														
<i>Halesus digitatus</i> (SCHRANK, 1781)			x									x			x							x			
<i>Halesus radiatus</i> (CURTIS, 1834)																						x			
<i>Halesus tesselatus</i> (RAMBUR, 1842)												x													
<i>Halesus</i> sp.												x													
<i>Parachiona picicornis</i> (PICTET, 1834)		x																							
<i>Potamophylax luctuosus</i> (PILLER & MITTERPACHER, 1783)				x	x																				
<i>Potamophylax</i> cf. <i>nigricornis</i> (PICTET, 1834)	x																								
<i>Potamophylax rotundipennis</i> (BRAUER, 1857)					x	x				x	x													x	
<i>Potamophylax</i> sp.	x					x	x										x								
<i>Lasiocephala basalis</i> (KOLENATI, 1848)				x																					
<i>Goera pilosa</i> (FABRICIUS, 1775)												x													
<i>Lithax obscurus</i> (HAGEN, 1859)										x			x			x									
<i>Silo piceus</i> (BRAUER, 1857)																								x	
<i>Notidobia ciliaris</i> (LINNEAUS, 1761)								x														x			
<i>Sericostoma</i> sp.	x	x	x	x	x	x							x	x		x	x	x	x	x			x	x	

- 298 taxa of macroinvertebrates of selected groups - Mollusca, Hirudinea, Crustacea, Ephemeroptera, Odonata, Plecoptera, Heteroptera, Coleoptera and Trichoptera
- interesting faunistic records (e.g. *Unio crassus* (Bivalvia), *Segmentina nitida* (Gastropoda), *Baetis pentaphlebodes* (Ephemeroptera), *Leuctra dalmoni* (Plecoptera), *Oligostomis reticulata*, *Parachiona picicornis* (Trichoptera))



- WFD
- NATURA 2000
- Invasive

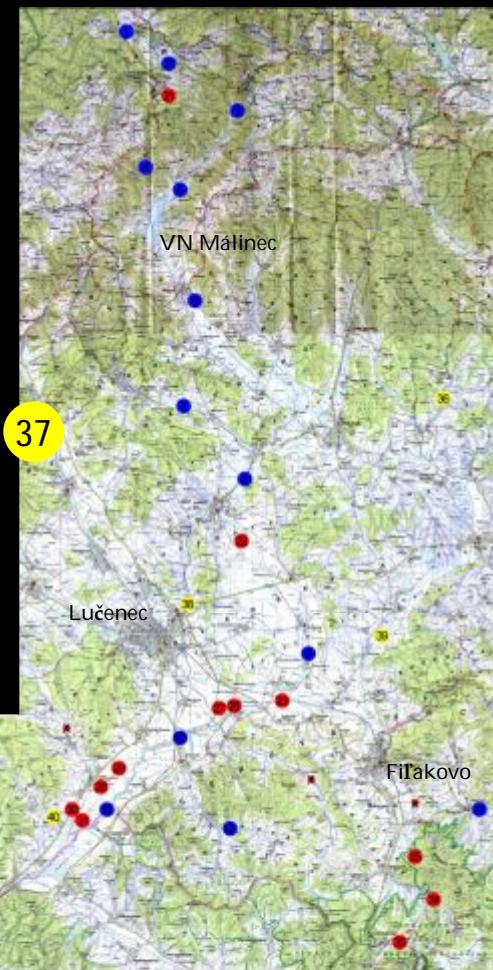


- WFD
- NATURA 2000
- Invasive



Invasive species

P. antipodarum (Gastropoda) - the only target invasive species recorded



- WFD
- NATURA 2000
- Invasive



Study was part of the project HUSK 0801/066 and partly also supported by the Slovak research and development agency under the contract no. APVV-20-019905 and by the Ministry of Education of the Slovak Republic - VEGA 1/0529/09



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