

Supplementary Material

Short Communication: First insights into the ectoparasitic helminth fauna of freshwater fish on an Adriatic island

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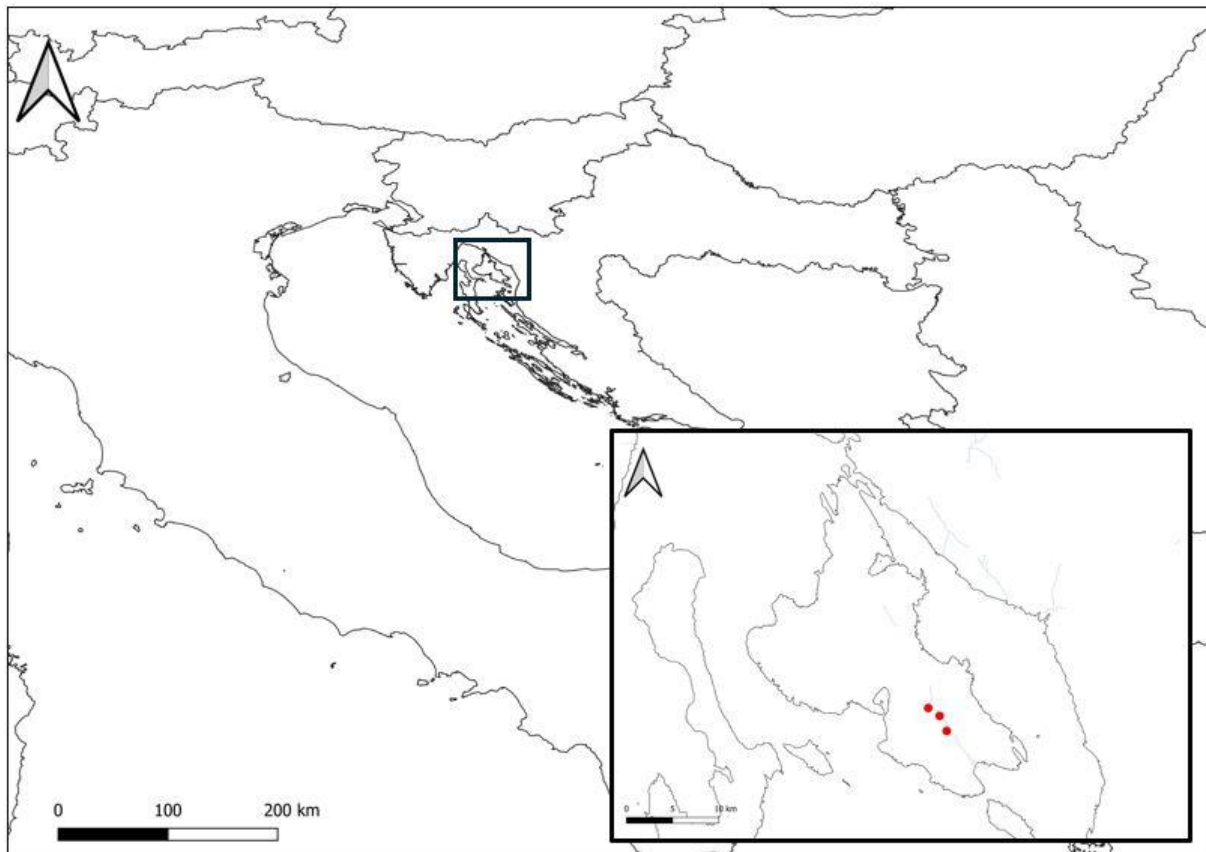
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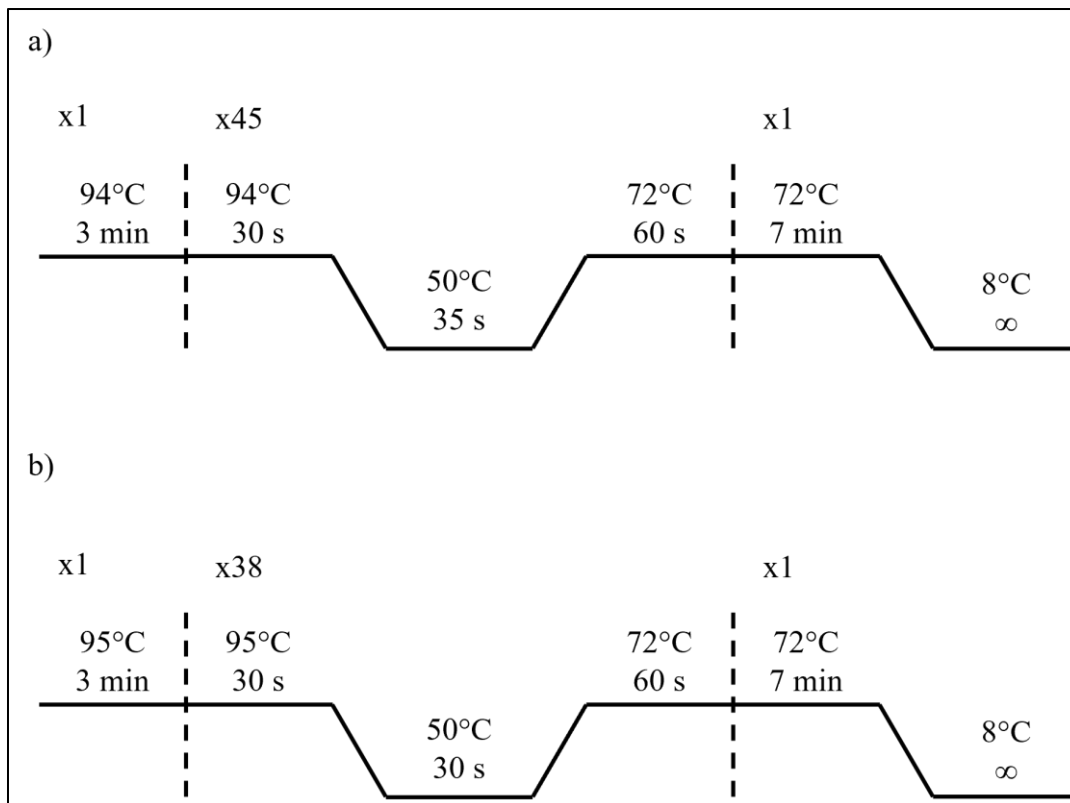
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Supplementary Figure S1. *Phoxinus lumaireul* (Schinz, 1840) specimen from Krk Island, April 2022, with metacercariae cysts (black spots).



Supplementary Figure S2. Krk Island, Croatia, located in northeastern Adriatic with fish collection sites (red dots).



Supplementary Figure S3. Polymerase chain reaction protocol for a) *Uvulifer* specimens and b) *Gyrodactylus* specimen.

Supplementary Table S1. Sequences downloaded from GenBank that were used for phylogenetic analysis.

GenBank accession number	Taxon
AY222172	<i>Ichthyocotylurus erraticus</i>
KU588151	<i>Tylodelphys</i> sp.
AF470581	<i>Bolbophorus damnificus</i>
KX931427	<i>Ornithodiplostomum scardinii</i>
KX931426	<i>Posthodiplostomum brevicaudatum</i>
MF398331	<i>Posthodiplostomum</i> sp.
AY222173	<i>Diplostomum phoxini</i>
JF820609	<i>Alaria mustelae</i>
MF568580	<i>Uvulifer spinatus</i>
MK874321	<i>Uvulifer batesi</i>
MK874324	<i>Uvulifer pequenae</i>
MK874323	<i>Uvulifer elongatus</i>
MF568579	<i>Uvulifer</i> sp.
MF568574	<i>Uvulifer</i> sp.
MK604824	<i>Uvulifer</i> sp.
MT395355	<i>Uvulifer</i> sp.
OP687987	<i>Uvulifer semicircumciscus</i>
MK874320	<i>Uvulifer ambloplitis</i>
MK874326	<i>Uvulifer weberi</i>
MF568567	<i>Uvulifer</i> sp.
MK874325	<i>Uvulifer prosocotyle</i>
AJ407929.2	<i>Gyrodactylus lomi</i>
AJ249350	<i>Gyrodactylus teuchis</i>
DQ823390	<i>Gyrodactylus salaris</i>
KP325622	<i>Gyrodactylus brachymystacis</i>
DQ355975	<i>Gyrodactylus derjavini</i>
AJ132259	<i>Gyrodactylus derjavinoides</i>
AJ407915.2	<i>Gyrodactylus aphyae</i>
AJ001841	<i>Gyrodactylus gasterostei</i>
AF484540	<i>Gyrodactylus luciopercae</i>
AJ011411	<i>Gyrodactylus rogatensis</i>
AJ001845	<i>Gyrodactylus pungitii</i>
EU554413	<i>Gyrodactylus botnicus</i>
OQ641786	<i>Gyrodactylus albolacustris</i>
HM192921	<i>Gyrodactylus pannonicus</i>
HM192928	<i>Gyrodactylus danastriae</i>

Supplementary Table S2. Information on the individual fish, with number of metacercarial cysts (black spots) and *Gyrodactylus* counted, plus information on sampling locality and data.

ID code (fish)	Standard length (mm)	Weight (g)	N black spots	N <i>Gyrodactylus</i>	Location		Samping date
					N	E	
PLA1	59	3.540	21		45°01'16.76"	14°40'59.09"	09.04.2022.
PLA2	68	5.525	56		45°01'16.76"	14°40'59.09"	09.04.2022.
PLA3	56	2.805			45°01'16.76"	14°40'59.09"	09.04.2022.
PLB1	66	4.699			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB2	38	0.844			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB3	51	1.995			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB4	51	2.025			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB5	51	1.981			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB6	32	0.788		1	44°59'57.66"	14°42'32.94"	29.10.2022.
PLB7	33	0.530			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB8	43	1.305			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB9	37	0.795			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB10	53	2.227			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB11	32	0.792			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB12	33	0.626			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB13	36	0.785			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB14	34	0.642			44°59'57.66"	14°42'32.94"	29.10.2022.
PLB15	34	0.650			44°59'57.66"	14°42'32.94"	29.10.2022.
PLC1	44	1.332	21		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC2	39	0.879	7		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC3	47	1.461	1		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC4	45	1.367	14		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC5	32	0.479	14		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC6	42	0.977	1		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC7	41	0.916	5		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC8	46	1.330			45°0'49.86"	14°41'56.16"	30.10.2022.
PLC9	40	0.900	3		45°0'49.86"	14°41'56.16"	30.10.2022.

PLC10	44	1.262	12	45°0'49.86"	14°41'56.16"	30.10.2022.
PLC11	40	0.895	7	45°0'49.86"	14°41'56.16"	30.10.2022.
PLC12	40	0.920	15	45°0'49.86"	14°41'56.16"	30.10.2022.
PLC13	43	1.145		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC14	43	1.082		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC15	39	0.828	2	45°0'49.86"	14°41'56.16"	30.10.2022.
PLC16	39	0.867	8	45°0'49.86"	14°41'56.16"	30.10.2022.
PLC17	42	1.020	8	45°0'49.86"	14°41'56.16"	30.10.2022.
PLC18	40	0.885		45°0'49.86"	14°41'56.16"	30.10.2022.
PLC19	32	0.483	12	45°0'49.86"	14°41'56.16"	30.10.2022.
PLC20	30	0.411		45°0'49.86"	14°41'56.16"	30.10.2022.

Supplementary Table S3. Pairwise uncorrected p-distances between *Uvulifer* species.

	<i>Uvulifer</i> sp. Croatia	<i>U.</i> <i>spinatus</i> MF568580	<i>Uvulifer</i> sp. MK604824	<i>Uvulifer</i> sp. MF568579	<i>Uvulifer</i> sp. MF568574	<i>Uvulifer</i> sp. MF568567	<i>U. batesi</i> MK874321	<i>U.</i> <i>pequenae</i> MK874324	<i>U.</i> <i>elongatus</i> MK874323	<i>Uvulifer</i> sp. MT395355	<i>U.</i> <i>semicircumciscus</i> OP687987	<i>U.</i> <i>ambloplitis</i> MK874320	<i>U. weberi</i> MK874326	<i>U.</i> <i>prosocotyle</i> MK874325
<i>Uvulifer</i> sp. Croatia														
<i>U. spinatus</i> MF568580	0.0079													
<i>Uvulifer</i> sp. MK604824	0.0040	0.0079												
<i>Uvulifer</i> sp. MF568579	0.0119	0.0079	0.0119											
<i>Uvulifer</i> sp. MF568574	0.0079	0.0000	0.0079	0.0079										
<i>Uvulifer</i> sp. MF568567	0.0039	0.01192	0.0079	0.0159	0.0119									
<i>U. batesi</i> MK874321	0.0079	0.0000	0.0079	0.0079	0.0000	0.0119								
<i>U. pequenae</i> MK874324	0.0079	0.0000	0.0079	0.0079	0.0000	0.0119	0.0000							
<i>U. elongatus</i> MK874323	0.01192	0.0079	0.0119	0.0079	0.0079	0.0079	0.0079	0.0079						
<i>Uvulifer</i> sp. MT395355	0.01191	0.0159	0.0119	0.0159	0.0159	0.0079	0.0159	0.0159	0.0079					
<i>U.</i> <i>semicircumciscus</i> OP687987	0.0079	0.0119	0.0079	0.0119	0.0119	0.0040	0.0119	0.0119	0.0040	0.0039				
<i>U. ambloplitis</i> MK874320	0.0079	0.0119	0.0039	0.0159	0.0119	0.0039	0.0119	0.0119	0.0079	0.0079	0.0040			
<i>U. weberi</i> MK874326	0.0039	0.0119	0.0079	0.0159	0.0119	0.0000	0.0119	0.0119	0.0079	0.0079	0.0039	0.0039		
<i>U. prosocotyle</i> MK874325	0.0119	0.0159	0.0079	0.0120	0.0159	0.0079	0.0159	0.0159	0.0119	0.0119	0.0079	0.0039	0.0079	

Supplementary Table S4. Pairwise uncorrected p-distances calculated between *Gyrodactylus* species. Only species most closely related to *Gyrodactylus* sp. found on *Phoxinus lumaireul* from Krk island are included.

	<i>Gyrodactylus</i> sp. Croatia	<i>G. albolacustris</i> OQ641786	<i>G. botnicus</i> EU554413	<i>G. pannonicus</i> HM192921	<i>G. danastriae</i> HM192928
<i>Gyrodactylus</i> sp. Croatia					
<i>G. albolacustris</i> OQ641786	0.0188				
<i>G. botnicus</i> EU554413	0.0188	0.0146			
<i>G. pannonicus</i> HM192921	0.0147	0.0105	0.0147		
<i>G. danastriae</i> HM192928	0.0125	0.0209	0.0146	0.0168	