BIOTOXMET PROJECT

overview after one year period

PI: Vlatka Filipović Marijić

Ruđer Bošković Institute

SECOND MEETING

Integrated evaluation of aquatic organism responses to metal exposure: gene expression, bioavailability, toxicity and biomarker responses (BIOTOXMET)

Zagreb, 16th December 2021

HRZZ Croatian Science Foundation

RB

ANDRIJA STAMPAR TEACHING INSTITUTE OF PUBLIC HEALTH

WELLFISH DIAGNOSTICS

MONTAN UNIVERSITÄT

FFoQSI

BIOTOXMET

PROJECT COLLABORATORS

Ruđer Bošković Institute – Division for Marine and Environmental Research, Zagreb, Croatia

Dr. sc. Irena Vardić Smrzlić

Dr. sc. Dušica Ivanković

Dr. sc. Damir Valić

Dr. sc. Zrinka Dragun

Tatjana Mijošek, M.Sc.Exp.Biol.

Zuzana Redžović, M.Sc.Exp.Biol.

Ivana Karamatić, mag. ing. techn. aliment.

Tomislav Kralj, M.Sc.Oecol.Prot.Nat.

Sara Šariri, PhD student

Dr. sc. Željka Fiket

28.12.2020.-27.12.2024.
1st year period 28.12.2020.-27.12.2021.

PROJECT COLLABORATORS

- **Institute for Medical Research and Occupational Health, Zagreb, Croatia**

Dr. sc. Zorana Kljaković-Gašpić

Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

Dr. sc. Želimira Cvetković

- **Wellfish Diagnostics, Paisley, UK**

Dr. sc. Josip Barišić

- **University of Leoben, Leoben, Austria**

Dr. sc. Thomas Prohaska

Dr. sc. Donata Bandoniene

(Dr.nat.techn. Johanna Irrgeher , Stefan Wagner)

- **Austrian Competence Centre for Feed and Food Quality, Safety & Innovation, Tulln, Austria**

Dr. sc. Andreas Zitek

PROJECT GOALS

1. seasonal and long-term trends of metal concentrations in the water and sediments of the Krka River and its tributaries

2. biological responses of aquatic organisms to metal exposure/impact under different environmental conditions

3. bioavailable and potentially toxic fraction of dietborne metals in fish

4. active cellular processes in acanthocephalans and fish intestine under different metal exposure regimes

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Work plan – 1st year

1st Project Period	
Results to be achieved	**Team member**
D1.1 Kick off meeting (Zagreb, RBI, summary record of the meeting prepared): **11th November 2021**  	All project members
project web page: **https://www.irb.hr/Zavodi/Zavod-za-istrazivanje-mora-i-okolisa/Laboratorij-za-bioloske-ucinke-metala/Projekti2/Integrirana-procjena-odgovora-akvatickih-organizama-na-izlozenost-metalima-ekspresija-gena-bioraspolozivost-toksicnost-i-biomarkerski-odgovori-BIOTOXMET**	S. Šariri

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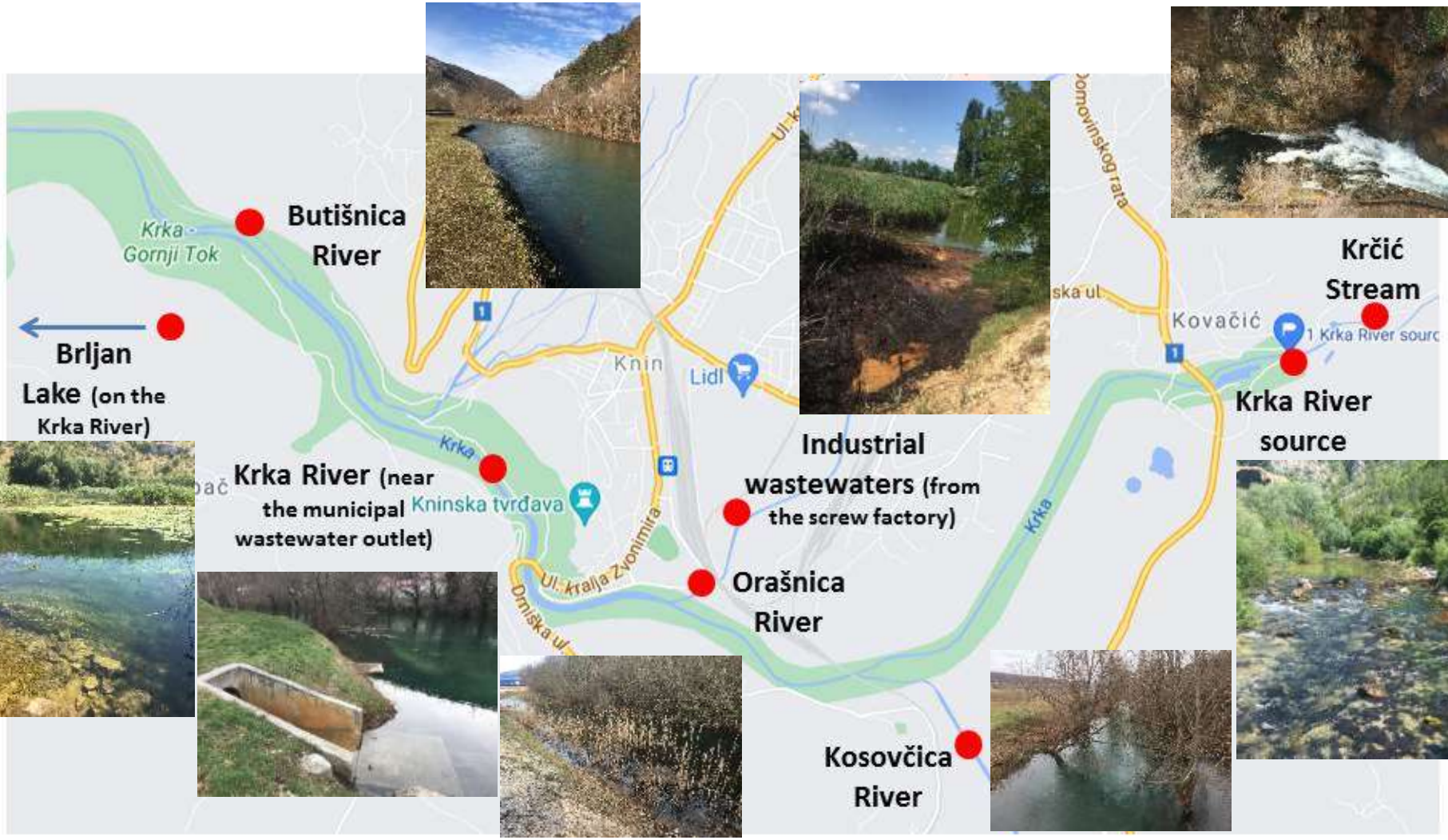
Work plan – 1st year

1st Project Period	
Results to be achieved	**Team member**
D1.2 Report on field sampling of water prepared for determination of: **a) physico-chemical water parameters and metal concentrations (locations I-VII, four times a year, sampling in triplicates at each location, 84 samples in total);** **28th January, 25th-27th April, 20th July, 18th-20th October** **a) $^{87}Sr/^{86}Sr$ isotope ratio (locations I-VII, once a year, Sampling in triplicates at each location, 21 samples in total);** **20th July** **a) water toxicity (locations I, II, VI, industrial and municipal wastewaters, twice a year, sampling in triplicates at each location, 30 samples in total)** **27th April, 20th July, 20th October**	D. Valić T. Kralj T. Mijošek I. Karamatić Z. Redžović S. Šariri V. Filipović Marijić (C. Boucaud)

Study area



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Work plan – 1st year

1st Project Period	
Results to be achieved	**Team member**
D1.3 Report on field sampling of sediments prepared for determination of: **a) carbonate content (locations I-VII, once a year, 7 samples in total);** **b) grain size distribution (locations I-VII, once a year, 7 samples in total);** **c) metal concentrations (locations I-VII, once a year, 7 samples in total)**	T. Kralj T. Mijošek I. Karamatić V. Filipović Marijić (C. Boucaud)

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Work plan – 1st year

D1.4 Report on field sampling of indicator organisms:

a) fish brown trout (locations I, II and III, twice a year, 35 fish individuals at each location, 210 individuals in total);

25th-27th April, 18th-20th October

a) acanthocephalan species *Dentitruncus truttae* (locations I, II and III, twice a year, all individuals)

(for molecular analyses 6-8 specimens of fish and acanthocephalans will be used, locations I and II, once a year, 12-16 individuals in total)

25th-27th April, 18th-20th October

D. Valić
T. Kralj
T. Mijošek
Z. Redžović
I. Karamatić
V. Filipović
Marijić
S. Šariri
(C. Boucaud)

Brown trout *(Salmo trutta* Linnaeus, 1758)

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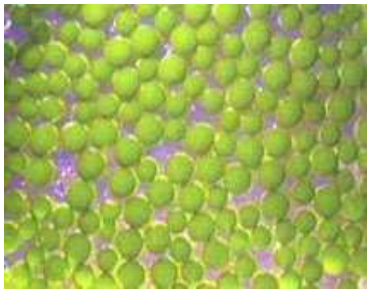
Work plan – 1st year

D1.5 Laboratory analyses conducted and reports on the analyzed results of water samples prepared:

a) **physico-chemical water parameters**
b) **concentrations of total and dissolved metals**
c) **$^{87}Sr/^{86}Sr$ isotope ratio**
d) **water toxicity based on laboratory tests using algae and Daphnia**

D. Valić
T. Kralj
T. Mijošek
Z. Dragun
Z. Kljaković Gašpić
D. Bandoniene
J. Irrgeher
T. Prohaska
Ž. Cvetković
I. Karamatić
S. Šariri
(A. Brkić)
(C. Boucaud)
(V. Mikulec)
(G. Filipović)

Green algae (*Selenastrum capricornutum* Printz, 1914)



Water flea (*Daphnia magna* Straus, 1820)

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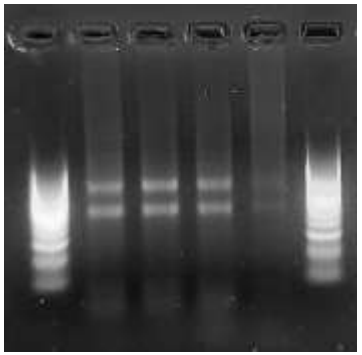
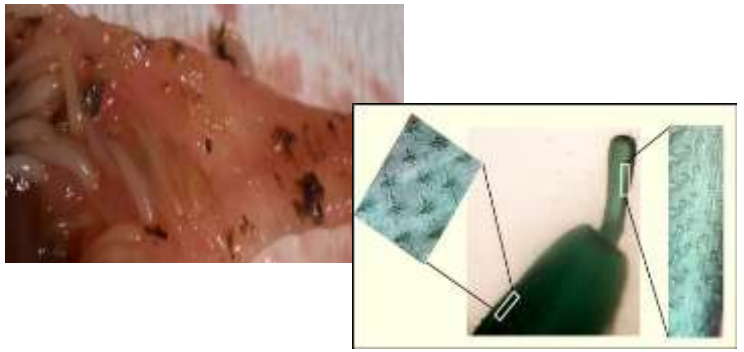
Work plan – 1st year

D1.6 . Laboratory analyses conducted and reports on the analyzed results of sediments samples prepared: **a) carbonate content** **b) grain size distribution** **c) metal concentrations**	Z. Kljaković Gašpić Service – RBI Ž. Fiket

Work plan – 1st year

D1.7 RNA of appropriate concentration and quality isolated from acanthocephalans for transcriptome profiling	I. Vardić Smrzlić S. Šariri
D1.8 De novo sequencing of transcriptome of acanthocephalans and estimation of differences in gene expression in acanthocephalans from the reference and pollution impacted site conducted	Commercial service (Novogene)





Acanthocephala *(Dentitruncus truttae* Sinzar, 1955)

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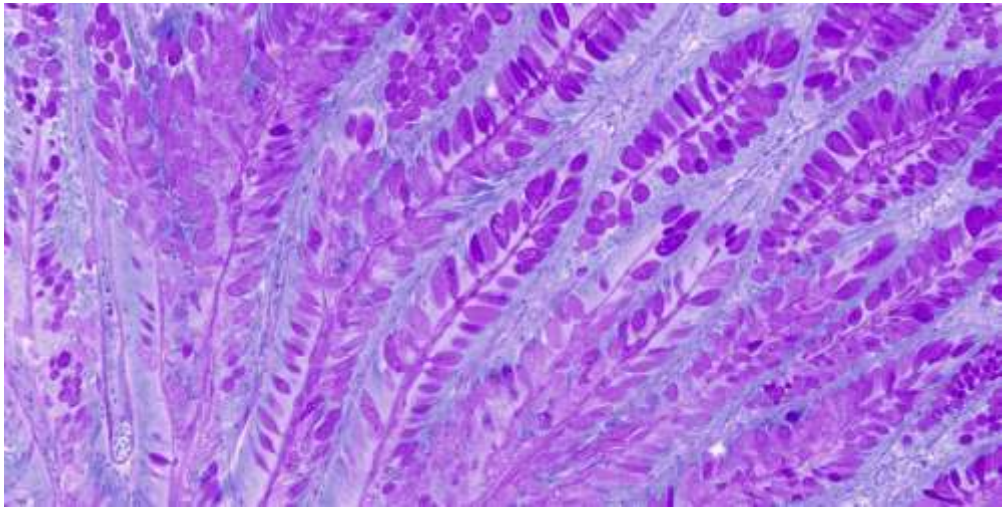
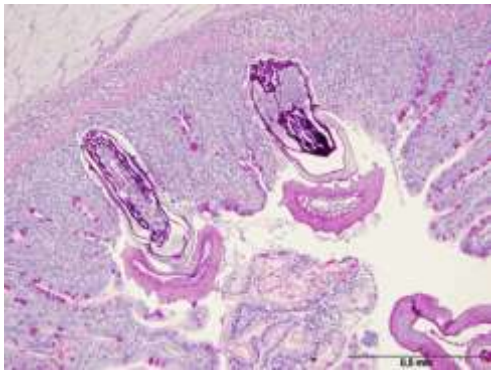
2. biological responses of aquatic organisms to metal exposure/impact under different environmental conditions

2.3. histopathological alterations, especially quantitative and qualitative changes of fish intestinal mucous cells- novel data on mucosal mapping;





Work plan – 1st

D1.9 Annual project meeting held (Zagreb, RBI)

THANK YOU FOR YOUR ATTENTION