

## ANNUAL REPORT ON GEOTRACES ACTIVITIES IN CROATIA

May 1st, 2017 to March 30th, 2018

### ***New scientific results***

The Croatian GEOTRACES activities were mainly related to: 1) improvement of electrochemical methods, which in combination with ICPMS, are used for trace metals speciation (including interaction with organic matter and sulfur species), determination and quantification (mostly Zn,Cd,Pb,Cu, Fe,Ni,Co); 2) development of a new sample changer for an automated system for determination of trace metals in natural waters (Voltammetric AutoAnalyser - Volt-AA) and solid (gold array micro disc) micro sensors for analysis of trace metals, 3) assessment of metal bioavailability in aquatic environment using passive samplers for metals (DGT) and cytosolic metal levels in tissues of aquatic organisms, 4) development of electroanalytical methods (chronocoulometry) for determination of metal sulphide and colloidal S species, including nanoparticles, in natural waters, 5) characterization of marine aerosols (PM2.5) regarding presence of organic matter, sulfur species and trace metals; 6) improvement of multielemental analysis in geological materials; 7) study of trace elements as indicators of environmental changes in lakes; 8) study of organotin persistence in marine sediments; 9) study of stability of silver nanoparticles in seawater

### ***New projects and/or funding***

Current projects supported by the Croatian Ministry of Science, Education and Sport and Croatian Science Foundation (CSF)

- 2014-2018 CSF project: "Appearance and interaction of biologically important organic molecules and micronutrient metals in marine ecosystem under environmental stress", AMBIOMERES
- 2014-2018 CSF project: "The Sulphur and Carbon dynamics in the Sea- and Fresh-water Environment", SPHERE 1205
- 2014-2018 CSF project: "Transport and Chemodynamics of Trace Elements in Freshwater and Coastal Sedimentary Systems"
- 2015-2019 CSF projekt: "New methodological approach to biogeochemical studies of trace metal speciation in coastal aquatic ecosystems" (MEBTRACE)
- 2015-2019 CSF project "Accumulation, Subcellular Mapping and Effects of Trace Metals in Aquatic Organisms" (AQUAMAPMET)
- 2015-2017: National Monitoring program of coastal Adriatic Sea (Croatian side) (trace metals, organic matter, organic pollutants)
- Collaboration on VALSE project (2017-2020) "Nouvelles ressources transfrontalières : vers une validation de scénarii de valorisation de sédiments et autres matériaux" INTERREG France - Wallonie – Vlaanderen

### ***Outreach activities***

- Accreditation of TOC, DOC, POC measurements in natural waters, including seawater and sediments according to HRN EN ISO/IEC 17025:2007. Accreditation Nb.1577.

### ***Other activities***

Active participation in the COST Actions TD 1407 and SCOR WG 139 and 145.

- N. Mikac, F. Pošćić, Ž. Fiket, N. Bačić, S. Perica, Rare earth elements (REE) transport from soil to olive and olive oil (2018). Ospina-Alvarez, N., Zimmermann, S. and Aruoja, V. (Eds). Book of Abstracts of the Workshop on Technology Critical Elements in Ecosystem and Human Health. NOTICE-COST action TD1407. Tallinn, Estonia. 19-20.4.2018.
- Participation in intercalibration exercise organized by COST action TD1407 on TCE (and other elements) in sediment.

### ***New publications (published or in press)***

- Bura-Nakić, E., Andersen M.B., Archer C., de Souza F., Marguš M., Vance D., Coupled Mo-U abundances and isotopes in a small marine euxinic basin: constraints on processes in euxinic basins, *Geochimica et Cosmochimica Acta*. 222 (2018); 212-229
- Furdek Turk, Martina; Senta, Ivan; Kniewald, Goran; Mikac, Nevenka. Determination of organotin compounds (OTC) at low levels in seawater by solid-phase extraction (SPE) and gas chromatography-pulsed flame photometric detection (GC-PFPD). // *International journal of environmental analytical chemistry*. 98 (2018), 1; 1-15).
- Fiket, Željka; Ivanić, Maja; Furdek Turk, Martina; Mikac, Nevenka; Kniewald, Goran. Distribution of trace elements in waters of the Zrmanja River estuary (eastern Adriatic coast, Croatia). // *Croatia Chemica Acta*. (2018), accepted.
- Filip Pošćić; Marko Runjić; Maja Jukić Špika; Nevenka Mikac; Zed Rengel; Marija Romić; Branimir Urlić; Niko Bačić; Mavro Lučić; Helena Bakić; Željka Fiket; Frane Strikić; Tatjana Klepo; Slavko Perica., Nutrient deficiencies in olives grown on typical Mediterranean soils (Terra rossa, Rendzina, Lithosol). // *Archives of Agronomy and Soil Science*. (2018), accepted.
- Fiket, Željka; Mikac, Nevenka; Kniewald, Goran. Influence of the geological setting on the REE geochemistry of estuarine sediments: a case study of the Zrmanja River estuary (eastern Adriatic coast). // *Journal of geochemical exploration*. 182 (2017), Part A; 70-79.
- Fiket, Željka; Pikelj, Kristina; Ivanić, Maja; Barišić, Delko; Vdović, Neda; Dautović, Jelena; Žigovečki Gobac, Željka; Mikac, Nevenka; Bermanec, Vladimir; Sondi, Ivan; Kniewald, Goran. Origin and composition of sediments in a highly stratified karstic estuary: an example of the Zrmanja River estuary (eastern Adriatic, Croatia). // *Regional Studies in Marine Science*. 16 (2017); 67-78.
- Ivanić, Maja; Lojen, Sonja; Grozić, Dino; Jurina, Irena; Škapin, Srečo D.; Troskot-Čorbić, Tamara; Mikac, Nevenka; Juračić, Mladen; Sondi, Ivan. Geochemistry of sedimentary organic matter and trace elements in modern lake sediments from transitional karstic land-sea environment of the Neretva River delta (Kuti Lake, Croatia). // *Quaternary international*. (2017), accepted.
- Participation in publication of the e-book: "Organic Ligands in Marine Trace Metal Biogeochemistry"

[https://www.frontiersin.org/books/Organic\\_Ligands\\_in\\_Marine\\_Trace\\_Metal\\_Biogeochemistry/1431](https://www.frontiersin.org/books/Organic_Ligands_in_Marine_Trace_Metal_Biogeochemistry/1431)

***Presentations in international conferences***

- Ciglène
- Iki I, Marguš M, Čanković M, Cvitešić I
- A, Petrić M
- Iki I, Collins G, Redox regime shifts in euxinic marine environment (Rogoznica Lake, eastern Adriatic coast), 255<sup>th</sup> ACS Meeting, New Orleans March 2018, Geochemistry session
- Helz GR, Ciglènečki I, The phantom of euxinia: zero-valent sulphur, Goldschmidt Conference Paris 2017, France

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