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## Comparison of the trace metals mass fractions adsorbed on the beached plastic litter: different ubiquitous items of every day use

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Massive plastic production has resulted in billions of tons of plastic material in landfills and the natural environment. A large portion of it ends up in the marine environment, with some of the most frequent and ubiquitous forms of plastics being cotton bud sticks, cigarette filters and plastic pellets. The enclosed character of Adriatic Sea results in substantial accumulation and plastic pollution, and plastic litter has been reported on beaches, seafloor and sea surface. Under certain physical and chemical conditions, marine (micro)plastics has the ability to adsorb different organic and inorganic matter, including potentially toxic trace metals. It becomes a vector for transport and contributes to the accumulation of trace metals, especially in the coastal areas. In order to evaluate the mass fractions of trace metals (Cd, Cu, Pb, Zn, Ni and Co) three types of the above mentioned plastic products were collected from the beached material in three geographically and antropogenically different areas of the eastern Adriatic sea coast, the Lastovo Islands Nature Park (southern Adriatic), and two enclosed and antropogenically affected zones (middle Adriatic), Kaštela bay and the River Krka estuary (Port of Šibenik). Trace metal amounts on plastic particles and its concentrations in seawater samples were determined using differential pulse anodic stripping voltammetry (DPASV) by Metrohm Autolab modular potentiostat/galvanostat Autolab PGSTAT204, connected with a three-electrode system Metrohm 663 VA STAND. Working electrode used was static mercury drop electrode (SMDE).

The mass fraction of metals from plastic pellets and cigarette filters is similar to those found in literature, as for the cotton bud sticks, to our knowledge, it has not been reported so far. The highest amount of most metals (Zn, Cd, Pb, Cu) was found on cigarette filters, possible due to its high porosity. Kaštela Bay, as a home of former chloralkali plant, was a source of the highest amount of adsorbed metals (Pb, Cu, Ni, Co). Zn, as the most abundant in seawater of all measured metals, was also present in the highest amounts on all plastic surfaces. The concentration factors for all metals except Ni were highest for filters compared to other materials, for most metals in the River Krka estuary, and for Cu in the Kaštela bay. The cotton bud sticks from Kaštela Bay showed highest concentration factor for Ni. There are numerous factors and processes influencing interaction between metal ions and microplastics, from seawater chemistry to characteristics of plastic materials including biofouling and degradation rate. Further research is required for better understanding of this interaction in different aquatic environments.

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