Chlorinated paraffins (CPs) are industrially produced compounds of the general formula C_nH_{2n-2-z}Cl_z, with the chlorine content between 10-72 %. Because of their chemical and thermal stability and high viscosity, chlorinated paraffins replaced PCBs in many applications after PCB usage was banned (Tomy G.T. et al., 1998; Coelhan M. et al., 2000; Koh I.O. et al., 2002): as lubricants and cutting fluids in metalworking industry, as flame retardants, paints, sealing materials and others. In the last decade, the annual world-wide production of CPs has been estimated to 300 000 tons.

The stability and low vapor pressure of CPs (comparable with PCBs and other semi-volatile compounds) influences their persistence in the environment. They have a potency to bioconcentration in the living organisms where they can cause a grow inhibition. CP pollutants were suggested to be included into UNECE Convention on Long-range Transboundary Air Pollution POPs Protocol after analysis the air samples from United Kingdom. The short chain chlorinated paraffins are listed as toxic compounds for aquatic organisms (WHO (World Health Organization), 1996; Vollrath A.R., 1998), the United States have placed CPs C_{10}-C_{13} on the Environmental Protect Agency’s (EPA) Toxic Release Inventory (TRI), and Canada has included them on Environment Canada’s Priority Substances List (Tomy G.T. et al., 1999).

The top layer sediment samples from the Czech Republic were analyzed to obtain the first information about contamination of the region by chlorinated paraffins. Sediment samples from three locations with different industrial charge were taken over the period of two years. Soxtec extraction with dichlormethan, purification on silica gel column (3% water), and GPC on Phenogel were used before the final analysis. The analysis was performed by a short column gas chromatography-electron capture negative ion mass spectrometry (SCGC/ECNI-MS). The concentration of the short chain chlorinated paraffins varied between 4.58 ng and 180.75 ng per gram of a dry weight. High-chlorinated undecanes prevailed in the samples.

These first results from the CP contamination screening in the Czech republic showed similar CP levels as reported from other Europian countries, and gave a base for more detailed investigation.

References