

TH258 Accumulation of Pharmaceuticals, Perfluorinated Compounds, Plasticisers and Illicit Drug Metabolite in Aquatic Sediment and Plants in Three Rivers of Greater London and SE England

J. Wilkinson, P.S. Hooda, Kingston University London / Natural and Built Environments; J. Swinden, J. Barker, S. Barton, Kingston University London / Life Sciences Pharmacy Chemistry. Accumulation of persistent organic pollutants (POPs) in sediment (n=23) and aquatic plants (n=15) was assessed by ultrasonication-assisted extraction (UAE) followed by an in-house validated method for solid phase extraction (SPE) and liquid chromatography tandem mass spectrometry (LC-MS/MS). Eleven POPs were selected: *inter alia* pharmaceuticals acetaminophen, diclofenac and ethinylestradiol, illicit drug metabolite benzoylecgonine, perfluorinated compounds perfluorooctanoic acid (PFOA), perfluorononanoic acid, perfluorooctanesulfonic acid (PFOS) and perfluorobutane sulfonic acid (PFBS), and plasticisers bisphenol-A (BPA), 4'-hydroxyacetophenone (HAP) and bisphenol-S (BPS). Sediment samples were air dried, homogenised, sieved to 500 µm then subjected to UAE for 20 m at 45°C in an extraction solution of 50:50 acetonitrile (ACN):Methanol (MeOH) with 1% acetic acid (v/v) followed by SPE and LC-MS/MS analysis. Bioaccumulation in aquatic plants was assessed using two species: Water Starwort (*Callitriche* sp., n=8) and Pondweed (*Potamogeton* sp., n=7). All plant samples were air dried, powdered, homogenised then subjected to UAE for 20 m at 40°C in an extraction solution of 25:75 ACN:MeOH with 1% acetic acid (v/v) followed by SPE and LC-MS/MS analysis. Mean recoveries were 76% for sediment and 82% for plants. Ten of eleven POPs were detected in sediments with frequencies ranging from 22-83% (benzoylecgonine and BPA respectively) and mean quantifiable concentrations ranging from 0.84-11.1 ng/g (BPS and BPA respectively). Organic matter content in sediment samples was estimated using standard methods for loss on ignition and ranged from 1.2-6.4%. Seven of eleven POPs were detected in *Callitriche* sp. with frequencies ranging from 13% (acetaminophen) to 100% (HAP, BPS, PFBS and PFOA) and mean quantifiable concentrations ranging from 0.42-113 ng/g (diclofenac and PFOS respectively). Lastly, eight of eleven POPs were detected in *Potamogeton* sp. with frequencies ranging from 14-100% (acetaminophen and HAP respectively) and mean quantifiable concentrations from 0.38-71.0 ng/g (acetaminophen and HAP respectively). Overall, levels of target POPs were lowest in sediment and highest in *Callitriche* sp. with mean levels as much as 18.3 and 11.5 times higher (PFOS) than in sediment and *Potamogeton* sp. respectively. The extent to which POP bioaccumulation may affect higher trophic levels is unclear and warrants further investigation.