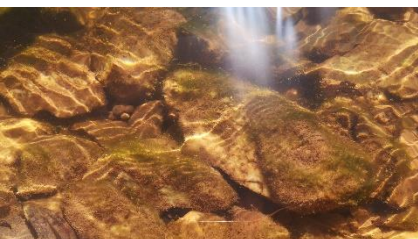


Bioaccumulation of polycyclic aromatic hydrocarbons (PAH) and per- and polyfluoroalkyl substances (PFAS) in river biofilms

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Is the biofilm a good monitoring matrix?

For what kind of pollutants?

Bioaccumulation of polycyclic aromatic hydrocarbons (PAH) and per- and polyfluoroalkyl substances (PFAS) in river biofilms

Preliminary investigation

One sampling campaign in the Kraichbach River, Germany

Biofilm, water, and sediment samples were collected and analyzed

Two sampling points: one downstream and one upstream a WWTP

16 PAHs (GC MS MS) and 20 polyfluorinated compounds (HPLC MS MS)

| PAHs | Biofilm | Biofilm | Sediment | Sediment | Water | Water |
|-------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| | Upstream (ng g ⁻¹) | Downstream (ng g ⁻¹) | Upstream (ng g ⁻¹) | Downstream (ng g ⁻¹) | Upstream (ng L ⁻¹) | Downstream (ng L ⁻¹) |
| Acenaphthylen | < LQ | 37 | < LQ | 23 | < LQ | < LQ |
| Anthracene | < LQ | 24 | < LQ | 27 | < LQ | < LQ |
| Benzo(a)anthracene | 130 | 170 | 84 | 190 | 24 | 20 |
| Benzo(a)pyrene | 180 | 230 | 110 | 220 | 28 | 24 |
| Benzo(b)fluoranthene | 190 | 240 | 120 | 230 | 30 | 26 |
| Benzo(ghi)perylene | 150 | 200 | 97 | 170 | 24 | 21 |
| Benzo(k)fluoranthene | 93 | 120 | 58 | 110 | 16 | 13 |
| Chrysen | 190 | 250 | 120 | 260 | 31 | 26 |
| Dibenz(ah)anthracen | 38 | 47 | 24 | 43 | 7 | 6 |
| Fluoranthene | 250 | 350 | 160 | 370 | 44 | 37 |
| Indeno(1,2,3-cd)pyrene | 150 | 200 | 96 | 170 | 28 | 26 |
| Naphthalene | 140 | 240 | 76 | 140 | 26 | 25 |
| Phenanthrene | 73 | 96 | 46 | 100 | 15 | 13 |
| Pyrene | 200 | 280 | 130 | 280 | 35 | 29 |
| PFAS | | | | | | |
| Perfluorbutanoate (PFBA) | < LQ | < LQ | < LQ | < LQ | 2 | 3 |
| Perfluorpentanoate (PFPA) | < LQ | < LQ | < LQ | < LQ | < LQ | 2 |
| Perfluorhexanoate (PFHxA) | < LQ | < LQ | < LQ | < LQ | 2 | 2 |
| Perfluoroctanoate (PFOA) | < LQ | < LQ | < LQ | < LQ | 1 | 2 |
| Perfluorbutansulfonate (PFBS) | < LQ | < LQ | < LQ | < LQ | 1 | 2 |

Polyfluorinated compounds were rarely detected in the samples

Biofilm may not be a good choice for monitoring matrix for PFAS

Many PAHs were detected in the samples

Some PAHs were detected with higher concentration in biofilm than in sediment

The results of biofilm and sediment show the influence of the WWTP