

## Accumulation and biotransformation of 8:2 polyfluoroalkyl phosphate diester in gilthead bream (*Sparus aurata*)

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Polyfluoroalkyl phosphate esters (PAPs) are high production volume surfactants used extensively as coating agents for paper and board food-contact materials. They have also found use in other surface treatment and protector applications, such as personal care and cosmetic products. Although PAPs have been shown to transform to perfluoroalkyl carboxylic acids (PFCAs) in microbial systems and in rats, no studies have investigated the fate and behavior of diPAPs in aquatic organisms. Therefore, the accumulation and biotransformation of 8:2 polyfluoroalkyl phosphate diester (8:2 diPAP) in fish was evaluated in the present work for the first time. Gilt-head bream (*Sparus aurata*) (n = 35) were dosed via the diet ( $29 \pm 5$   $\mu\text{g/g}$ , at 1.5 % body weight per day) for 7 days, during which time 8:2 diPAP and its transformation products (TPs) were measured in plasma, liver, muscle, gills, bile and brain. 8:2 diPAP tended to accumulate in liver, plasma and gills, and to a lesser extent in muscle, bile and brain. Several TPs were also observed in most tissues and biofluids, including both saturated and unsaturated fluorotelomer acids (8:2 FTCA, 8:2 FTUCA, 7:3 FTCA), and perfluorooctanoic acid (PFOA). 8:2 FTCA was the major TP in all tissues (0.2-1.8 ng/g) and biofluids (2.2 - 3.5 ng/mL), except for the bile, where PFOA occurred at the highest concentrations (up to 1.3 ng/mL). Unexpectedly high PFOA levels (up to 3.7 ng/g) were also observed in brain. Phase 2 metabolites, which have been reported in fish following exposure to higher concentrations of fluorotelomer alcohols, were not observed here, probably due to their low abundance. Nevertheless, the presence of PFOA indicates that exposure to PAPs could be an indirect route of exposure to PFCAs in fish.