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Occurrence and levels of persistent organic pollutants (POPs) in farmed and wild marine fish from Tanzania. A pilot study

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In 2016, farmed and wild milkfish (Chanos chanos) and mullet (Mugil cephalus) from Tanzania mainland (Mtwara) and Zanzibar islands (Pemba and Unguja) were collected for analyses of persistent organic pollutants (POPs). Fish livers were analysed for organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), brominated flame retardants (BFRs). Muscle tissue was used for analyses of perfluoroalkyl substances (PFASs). The major contaminant was p,p'-DDE. The highest p,p'-DDE concentration was found in wild milkfish from Mtwara (715.27 ng/g lipid weight (lw)). This was 572 times higher than the maximum level detected in farmed milkfish from the same area. The ratios of p,p'-DDE/p,p'-DDT in wild milkfish and mullet from Mtwara and Pemba indicate historical use of DDT. In contrast, ratios in farmed milkfish from Unguja and Mtwara, suggest recent use. The levels of HCB, HCHs and trans-nonachlor were low. ∑10PCBs levels were low, ranging from <LOD to 8.13 ng/g lw with the highest mean level found in farmed milkfish from Shakani, Unguja (3.94 ng/g lw). The PCB pattern was dominated by PCB 153>180>138. PBDEs were detected in low and varying levels in all locations. BDE-47 was the dominating congener, and the highest level was found in farmed milkfish from Jozani (1.55 ng/g lw). HBCDD was only detected in wild mullet from Pemba at a level of 16.93 ng/g lw. PFAS was not detected in any of the samples. POP levels differed between geographic areas and between farmed and wild fish. Human activities seem to influence levels on PCBs and PBDEs on Unguja.