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Brominated flame retardants and organochlorine pollutants in eggs of little owls (*Athene noctua*) from Belgium

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Abstract

Residues of brominated diphenylethers (PBDEs), organochlorinated pesticides (OCPs) and polychlorinated biphenyls (PCBs) were measured in 40 eggs of little owls (*Athene noctua*), a terrestrial top predator from Belgium. The major organohalogen detected were PCBs (median 2,600 ng/g lipid, range 790–23,000 ng/g lipid). PCB 153, 138/163, 170, 180 and 187 were the predominant congeners and constituted 71% of total sum PCBs. PBDEs were measurable in all samples, but their concentrations were much lower than for PCBs, with a range from 29–572 ng/g lipid (median 108 ng/g lipid). The most prevalent PBDE congeners in little owl egg samples were BDE 47, 99 and 153. This profile differs from the profile in marine bird species, for which BDE 47 was the dominant congener, indicating that terrestrial birds may be more exposed to higher brominated BDE congeners than marine birds. The fully brominated BDE 209 could be

detected in one egg sample (17 ng/g lipid), suggesting that higher brominated BDEs may accumulate in terrestrial food chains. Brominated biphenyl (BB) 153 was determined in all egg samples, with levels ranging from 0.6 to 5.6 ng/g lipid (median 1.3 ng/g lipid). Additionally, hexabromocyclododecane (HBCD) could be identified and quantified in only two eggs at levels of 20 and 50 ng/g lipid. OCPs were present at low concentrations, suggesting a rather low contamination of the sampled environment with OCPs (median concentrations of sum DDTs: 826 ng/g lipid, sum chlordanes: 1,016 ng/g lipid, sum HCHs: 273 ng/g lipid). Hexachlorobenzene (HCB) and octachlorostyrene (OCS) were also found at low median levels of 134 and 3.4 ng/g lipid, respectively. Concentrations of most analytes were significantly higher in eggs collected from deserted nests in comparison to addled (unhatched) eggs, while eggshell thickness did not differ between deserted and addled eggs. No significant correlations were found between eggshell thickness and the analysed organohalogenes.



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Keywords

Brominated flame retardants; Polychlorinated biphenyls; Organochlorine pesticides; Little owl; Eggs; Biomonitoring

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