DEGRADATION OF PHARMACEUTICAL AND PERSONAL CARE PRODUCTS DURING SEWAGE SLUDGE COMPOSTING

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Abstract

The aim of this work was to determine the impact of different ratios of bulking agent on the degradation of pharmaceutical and personal care product (PPCP) residues in sewage sludge compost. The behaviour of four PPCPs has been studied during 30 days composting period: one anti-epileptic (Carbamazepine), one non-steroidal anti-inflammatory (Diclofenac), one anti-eptileptic (Metformin) and one antimicrobial (Triclosan). Sewage sludge samples (anaerobically digested and dewatered by centrifugation) were collected from municipal wastewater treatment plant. The sludge was mixed with different bulking agents. The results of the analyses indicated that none of the compost samples was originally free of Carbamazepine, Diclofenac and Triclosan residues. Among the substances considered, the higher removal efficiencies (over 90%) were evident for the Diclofenac and Metformin. For Triclosan these values ranged between 55% and 81% (depending on the ratios of sludge and bulking agent). Carbamazepine showed no degradation. The results of this study show that by using different amendments, the effectiveness of the degradation of pharmaceuticals may increase during composting, whereas for the elimination of CBZ from sewage sludge different means should be used.

Keywords: Degradation, Compost, Carbamazepine, Diclofenac, Triclosan, Metformin, Sewage Sludge

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