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EDITORIAL
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Editorial: Environmental Behavior and Control of Emerging Chemical Pollutants

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Editorial on the Research Topic

Environmental Behavior and Control of Emerging Chemical Pollutants

Human and ecological receptors share a common environment which encompasses a myriad of chemicals, where emerging chemical pollutants play a key role globally in the field of environmental behavior and control, which are produced, consumed, and released into the environment on an unprecedented scale, and their residues can adversely affect aquatic and terrestrial ecosystems. However, emerging chemical pollutants entering the environment can transfer between compartments, such as air, soil and water, and their fate, behavior and (eco)toxicological effects are still poorly understood. Therefore, we need to better understand behavior effects of emerging chemical pollutants and provide corresponding control strategies. This special issue aims to understand environmental behavior of recent emerging chemical pollutants and provide insights into the development of control strategies on emerging chemical pollution. All accepted papers were summarized as follows:

In the paper by Wdowczyk and Szymańska-Pulikowska, Leachate pollution index (LPI) and toxicity index were used to determine the degree of leachate contamination. It is demonstrated that the variation of index values was particularly obvious between active and closed landfills and was related to the physicochemical compositions of leachates, where LPI value ranged from 7.4 to 11.1 in closed landfills, while from 12.9 to 15.9 in active landfills. The results showed that leachate at low concentrations can promote plant growth. At higher concentrations (50 and 100%), leachates caused inhibition of root and shoot growth, which was correlated with high LPI values. The results confirmed the relationship between the toxic effects on plants and the LPI values. Therefore, LPI values can be considered as a reliable indicator of leachate toxicity.

The work by Song et al. was targeted to study the influences of antibiotics on the compositions of the bacterial community structure during aerobic composting with swine manure. It is indicated that the family compositions in the ciprofloxacin treatment significantly differed from the other antibiotics. The presence of ciprofloxacin increased both the abundance and diversity of the bacterial community (the Chao index changed from 588.44 to 680.17, and the Shannon index changed from 3.41 to 4.06) in the end of composting. Compared to other antibiotics, ciprofloxacin altered the synergistic or competitive relationships between different families (norank_SBR1031 and Microscillaceae), leading to different bacterial community compositions. These results also demonstrated that ciprofloxacin significantly influenced the physical and chemical properties of composting, altered the bacterial community structure. These findings have important implications for a better understanding of the effects of antibiotic types on bacterial community structure and the involved mechanisms during swine manure composting.

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In the paper of Liu et al., authors measured ambient air quality of PM10, SO_2 and NO_2 in 12 monitoring stations, and obtained childhood laryngitis prevalence and confounding covariates by questionnaire. It is indicated that the lifetime prevalence of childhood laryngitis (12.2%) was associated with an interquartile range increase in late preconception [odds ratio (95% confidence interval, CI): 1.43 (1.06–1.92)], prenatal [1.35 (1.02–1.79)] and early-postnatal [1.32 (1.11–1.57)] exposure to SO_2. These findings suggest that early-life exposure to SO_2 significantly increases risk of childhood laryngitis. Preventive measures need to be implemented to mitigate industrial air pollution.

In the paper of Li et al., they examined the effects of birnessite (δ-MnO_2) on the transport and retention of five PPCPs in porous media under steady saturated flow conditions. It is demonstrated that the difference in the affinity of the five PPCPs was correlated to their polarity characteristics. Results suggested that polar compounds (such as bisphenol-A, tetracycline, and ciprofloxacin) had a higher affinity to birnessite-coated sands than the weak polar compounds (such as ibuprofen and carbamazepine) because the polarity was favorable to electrostatic attraction and oxidative reaction. The polarity-based correlation extended traditional electrostatic theory while well interpreting the complicated effects of birnessite on the adsorption and transport of PPCPs, especially neutral or non-dissociated compounds like carbamazepine.

AUTHOR CONTRIBUTIONS

MH organized the special issue and wrote the text. JW and XZ were assisted in handling the special issue.

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