127 - Dynamic coupled fluxes of current-use pesticides in air-water/soil-sediment system in a city in southern China

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Dynamic coupled fluxes of organophosphate and pyrethroid pesticides were analyzed based on monitoring data to diagnose the key fate and transport processes in an air-water/soil-sediment system in Guangzhou, China. The total air-water fluxes including air-water exchange, dry particle deposition, wet particle deposition, and wet dissolved deposition exhibited deposition for chlorpyrifos, bifenthrin, and cypermethrin, while volatilization was observed for *lambda*-cyhalothrin and permethrin. The direction of water-sediment diffusion was from sediment porewater to overlying water for all the target pesticides. However, the net direction of pesticide transport was from overlying water to sediment, because suspended particle settling and sediment burial processes dominated the transport. Chlorpyrifos had similar total air-water and water-sediment fluxes, which suggested that atmospheric loading was one of the important sources for water and sediment budgets. Instead, the total air-water fluxes of pyrethroids were two to three orders of magnitude lower than total water-sediment fluxes, and suggesting that sediment-associated pyrethroids were not mainly from air deposition. The estimated soil runoff fluxes of pyrethroids were similar to the total water-sediment fluxes, which suggested that soil runoff might be one of the important sources for water and sediment budgets. Additionally, annual fluxes of current-use pesticides were calculated in Chebei Creek, the longest urban creek in Tianhe, Guangzhou. This is one of the limited studies assessing the dynamic fluxes of chlorpyrifos and pyrethroids in an air-water/soil-sediment system. The results gave a better description on the distribution and fate of pesticides among the environmental compartments and provided basic data for comprehensive risk assessment of current-use pesticides.

Monday, September 9, 2013 01:30 PM
AGRO Education Award Poster Session (01:30 PM - 05:30 PM)
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