Temporal variation in indoor transfer of dirt-associated environmental bacteria in agricultural and urban areas

An agricultural environment and exposure to diverse environmental microbiota has been suggested to confer protection against immune-mediated disorders. As an agricultural environment may have a protective role, it is crucial to determine whether the limiting factors in the transfer of environmental microbiota indoors are the same in the agricultural and urban environments. We explored how sampling month, garden diversity and animal ownership affected the indoor-transfer of environmental microbial community. We collected litter from standardized doormats used for 2weeks in June and August 2015 and February 2016 and identified bacterial phylotypes using 16S rRNA Illumina MiSeq sequencing. In February, the diversity and richness of the whole bacterial community and the relative abundance of environment-associated taxa were reduced, whereas human-associated taxa and genera containing opportunistic pathogens were enriched in the doormats. In summer, the relative abundances of several taxa associated previously with beneficial health effects were higher, particularly in agricultural areas. Surprisingly, the importance of vegetation on doormat microbiota was more observable in February, which may have resulted from snow cover that prevented contact with microbes in soil. Animal ownership increased the prevalence of genera Bacteroides and Acinetobacter in rural doormats. These findings underline the roles of season, living environment and lifestyle in the temporal variations in the environmental microbial community carried indoors. As reduced contact with diverse microbiota is a potential reason for immune system dysfunction, the results may have important implications in the etiology of immune-mediated, non-communicable diseases.

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Vertical profiles of lung deposited surface area (LDSA) concentration measured with a drone in an urban street canyon (MP-17)

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Vertical profiles of lung deposited surface area concentration of particulate matter measured with a drone in an urban street canyon

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Chasing measurements for real-world emissions of city buses

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Characterization of fine fraction mined from two Finnish landfills
A fine fraction (FF) was mined from two Finnish municipal solid waste (MSW) landfills in Kuopio (1- to 10-year-old, referred as new landfill) and Lohja (24- to 40-year-old, referred as old landfill) in order to characterize FF. In Kuopio the FF (<20mm) was on average 45±7% of the content of landfill and in Lohja 58±11%. Sieving showed that 86.5±5.7% of the FF was smaller than 11.2mm and the fraction resembled soil. The total solids (TS) content was 46-82%, being lower in the bottom layers compared to the middle layers. The organic matter content (measured as volatile solids, VS) and the biochemical methane potential (BMP) of FF were lower in the old landfill (VS/TS 12.8±7.1% and BMP 5.8±3.4m^3 CH_4/t TS) than in the new landfill (VS/TS 21.3±4.3% and BMP 14.4±9.9m^3 CH_4/t TS), and both were lower compared with fresh MSW. In the Kuopio landfill materials were also mechanically sieved in the full scale plant in two size fraction <30mm (VS/TS 31.1% and 32.9m^3 CH_4/t TS) and 30-70mm (VS/TS 50.8% and BMP 78.5m^3 CH_4/t TS). The nitrogen

(3.5±2.0g/kg TS), phosphorus (<1.0-1.5g/kg TS) and soluble chemical oxygen demand (COD) (2.77±1.77kg/t TS) contents were low in all samples. Since FF is major fraction of the content of landfill, the characterization of FF is important to find possible methods for using or disposing FF mined from landfills.

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