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ASSESSMENT OF THE POTENTIAL RISKS OF AIRBORNE MICROBIAL CONTAMINATION IN SOLID RECOVERED FUEL PLANTS: A CASE STUDY IN ISTANBUL

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Abstract

In this pilot study, exposure to airborne microorganisms in solid recovered fuel (SRF) plants has been measured. Different steps in SRF production processes such as separation and size reduction can cause generation of airborne microorganisms. Exposure to these biological agents can cause some health problems, so their levels should be measured to assess the potential risks. Therefore, exposure to airborne total bacteria, Gram-negative bacteria, actinomycetes and fungi were measured in the running SRF plant. Sample locations were chosen considering work areas and wind direction in the plant. Airborne microorganisms were collected via AES Sampl'air Lite on particular agar plates and incubated for microorganism growth. No thermophilic actinomycetes were obtained from the samples. The measured concentrations of mesophilic heterotrophic bacteria were almost similar at each point throughout the SRF plant (ranged from 920 to 1750 CFU/m³) except the spare waste stock area (427 CFU/m³) and the monitoring room (ranged from 420 to 770 CFU/m³). The highest concentrations were measured near the pre-shredder (1750 CFU/m³) and in the manual sorting unit (1610 CFU/m³). However, the concentrations of Gram-negative bacteria varied at each point (28 to 700 CFU/m³). Fungi concentrations varied from 280 to 1750 CFU/m³ and were high near the sorting unit, the ballistic separator, the fine shredder, the end-product stock area and the monitoring room (1750 CFU/m³). The concentrations of mesophilic heterotrophic bacteria, Gram-negative bacteria and fungi did not exceed the recommended limit values.

Key words: airborne microorganisms, bacteria, bioaerosol, solid recovered fuel (SRF)

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