

DISTRIBUTION OF POLYCYCLIC AROMATIC HYDROCARBONS IN VARIOUS ORIGIN COMPOSTS

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INTRODUCTION TO THE TOPIC & METHODOLOGY

The rising amount of waste induces waste disposal issues; therefore, the search for methods to reduce the negative effects of accumulated waste is ongoing. Composting is one of the most effective ways to manage biodegradable waste. High-quality compost serves as both a beneficial fertilizer for plants and an improver of soil quality. Since compost is produced from organic waste, it is extremely important to identify both its positive and negative effects on plants, soil, and the environment. Soil contaminated with persistent organic pollutants can negatively impact plant productivity by disrupting normal growth and development. This study focuses on screening the distribution of polycyclic aromatic hydrocarbons (PAHs) in four different types of compost produced in Lithuania. The composts were collected from regional waste treatment plants operating in Lithuania. Quantitative analysis of PAHs was performed using gas chromatography coupled with mass spectrometry (GC-MS).

RESULTS

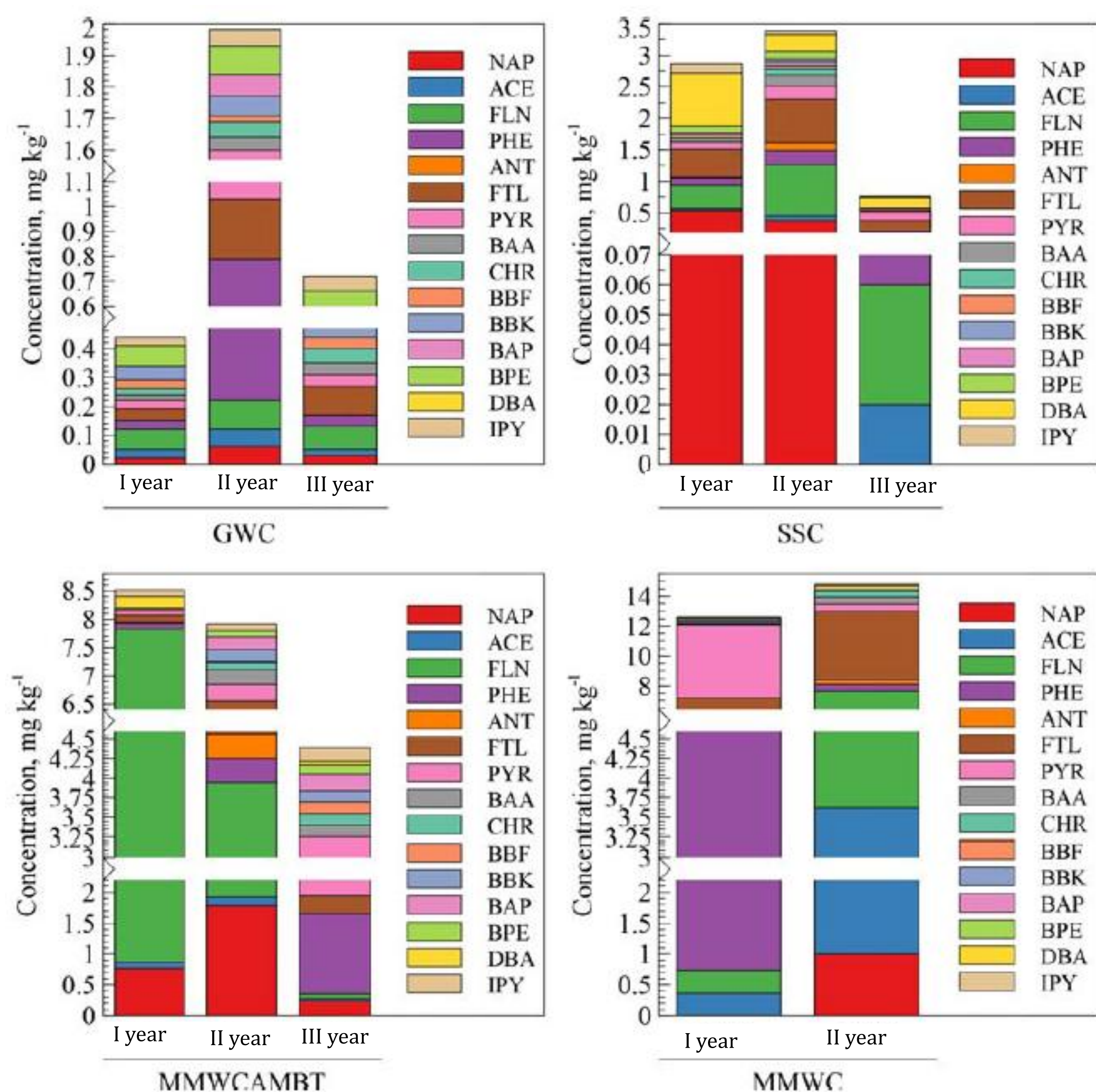


Figure 2. Distribution of polycyclic aromatic hydrocarbons in different kinds of compost during 3 years' period. NAP, naphthalene; ACE, acenaphrhylene; FLN, fluorene; PHE, phenanthrene; ANT, anthracene; FTL, fluoranthene; PYR, pyrene; BAA, benzo(a) anthracene, CHR, chrysene; BBF, benzo(b)fluoranthene; BBK, benzo(k)fluoranthene; BAP, ben(α)pyrene; BPE, benzo(g,h,i)perylene; DBA, dibenzo(a,h)anthracene; IPY, indeno(1,2,3-c,d)pyrene.

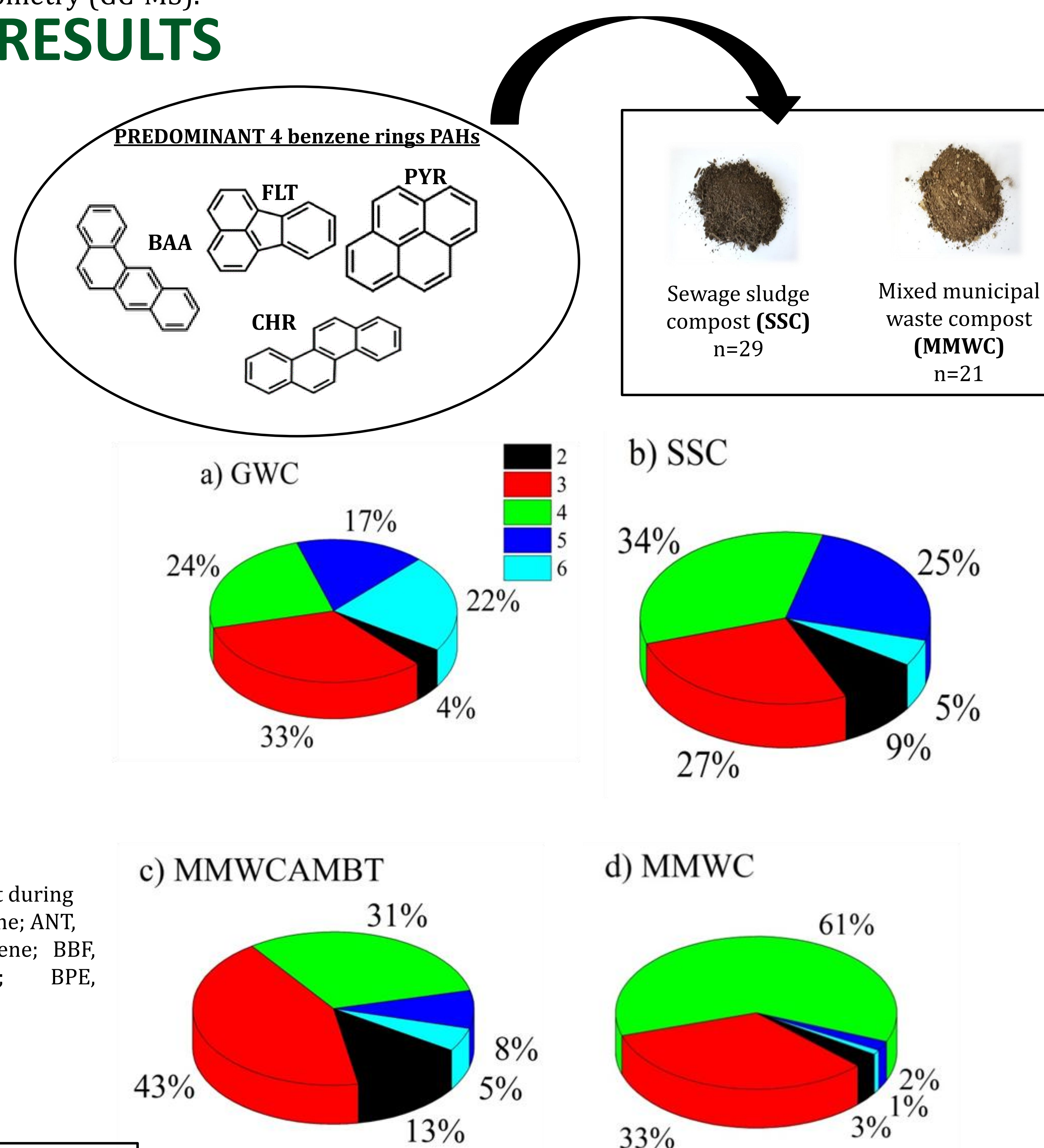


Figure 2. Distribution of polycyclic aromatic hydrocarbons in different kinds of compost (a) green waste compost; (b) sewage sludge compost; (c) mixed municipal waste compost after mechanical-biological treatment (d) mixed municipal waste compost according to benzene ring number.

CONCLUSIONS

During the study quantitative analysis was performed on 15 PAHs included in the list of priority pollutants by US Environmental Protection Agency. The abundant PAH homologues in GWC were fluoranthene, pyrene and benzo(g,h,i)perylene. The highest amount of

dibenzo(a,h) anthracene, fluoranthene and phenanthrene was found in SSC. MMWCAMBT dominated compound was fluorine which accounted for 82% and 24% of the total PAH content found in different study years. Fluoranthene, pyrene and fluorine were dominant in MMWC. Different types of compost should be carefully investigated before being considered for use as soil amendments.

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