THE IMPACT OF BIODEGRADABLE WASTE SHREDDING ON THE QUALITY OF THE PRODUCED COMPOST

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Abstract
Research on the morphological, granulometric and chemical composition of shredded food waste and the sieved compost obtained from it were carried out at the Waste Management Technology Center of the Lithuanian Alytus region.

The coarse fraction of the mixture of food and wood waste separated during shredding (60% of the shredded waste) consists of high calorific fractions suitable for the production of solid recovered fuel - 83% wood, 16% plastic and 1% paper.

Among the studied granulometric subfractions of fine material, > 5 mm and 2.5 ÷ 5 mm subfractions clearly dominate. The amount of non-compostable particles larger than 2 mm (plastic, glass, pebbles) in the compost exceeds the applicable norms by about 10 times.

Chemical composition (organic part, mineral part, elemental composition, amounts of heavy metals) tests were carried out for various granulometric fractions of materials: > 5 mm, 2.5 ÷ 5 mm, 1 ÷ 2.5 mm, 0.5 ÷ 1 mm, 0.2 ÷ 0.5 mm and < 0.2 mm.

The amounts of microplastics in shredded food waste and compost obtained from it are close and reach up to 5000 particles/kg. In comparison with the data obtained earlier in 2020 and 2021, we see an increase in the amount of microplastics by about 1000 particles/kg, which indicates that the mechanical processes of crushing and sieving with a star separator have a noticeable influence on the formation of microplastics.

Both in the case of shredded food waste and the sieved compost obtained from it, a larger organic part is characteristic of smaller granulometric fractions.

The amounts of potassium and phosphorus in the compost increase noticeably in the smaller granulometric fractions, while the nitrogen content shows an inverse variation.

Smaller granulometric fractions of waste and compost are characterized by a higher content of heavy metals. Exceeding the limit concentrations of cadmium, chromium, copper and nickel is observed in smaller granulometric fractions, which does not affect the total amount due to relatively small parts of smaller granulometric fractions.

Keywords: food waste, compost, granulometric fractions, microplastics, heavy metals.

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