EFFECT OF TYPE AND PROPORTION OF DIFFERENT STRUCTURE-CREATING ADDITIONS ON THE INACTIVATION RATE OF PATHOGENIC BACTERIA IN SEWAGE SLUDGE COMPOSTING IN A CYBERNETIC BIOREACTOR

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Abstract: The paper contains a micobiological characteristic of sewage sludge composted in controlled conditions together with bio-wastes (straw, sawdust, bark). An experiment was carried out in which the composted material was mixed up in adequate weight proportion and placed in bioreactor chambers with a constant air flow. The composting process aimed at defining the development dynamics and the survival of pathogenic microorganisms in the sewage sludge composted with different additions in a cybernetic bioreactor. Samples of compost necessary for microbiological analyses were taken at the same time, in reference to the actual temperature value. Bacteriological studies were carried out on selected substrates by plate method determining the number of pathogenic bacteria from the species: *Salmonella*, *Clostridium perfringens*, as well as from *Enterobacteriaceae* family. In the experiments, the presence of living eggs of intestinal ATT pathogens was determined by floatation method, as well. It was found that the sewage sludge used in composting process did not contain any *Salmonella* spp. bacteria or any living eggs of intestinal ATT pathogens. Composting process completely eliminated the number of bacteria from *Enterobacteriaceae* family, but it did not contribute to the elimination of *Clostridium perfringens* bacteria. On the basis of the obtained results, it was found that the elimination of the studied groups of microorganisms, in all studied composts took place with the increase of temperature. In the case of *Enterobacteriaceae*, it was found that their complete removal from the composted material took place in chamber K3, while in the remaining chambers, it followed 48 hours later. Elimination of the vegetative forms of *Clostridium perfringens* bacteria followed after 96 hours of composting, in all composts at the same time. The obtained composts met the sanitary norms according to the regulations of the EC Commission No. 185/2007 of February 20, 2007 which changed the regulation of WE No. 809/2003 and WE No. 810/2003 referring to the extension of the validity period of transitional means for composting plants and biogas producing plants according to the instruction of WE No. 1774/2002 of European Parliament and Council and according to the instruction of the Minister for Agriculture and Country Development (2004).