Roles of Methanogens on Volatile Organic Sulfur Compound Production in Anaerobically Digested Wastewater Biosolids

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ABSTRACT
Land application of wastewater biosolids is both economical and beneficial to resource recycling. However, this environmentally friendly practice can be at risk due to odor complaints. Volatile organic sulfur compounds (VOSCs) including methanethiol, dimethyl sulfide, and dimethyl disulfide, have been identified as major contributors to biosolids odor. In this study, methanogens were shown to play a key role in removing VOSCs and reducing odors, and methane production was related to reduced VOSC production. Factors influencing the growth of methanogens such as the shear during dewatering and storage temperature showed a strong impact on net odor production. Examination of the microbial communities of both bacteria and archaea indicated a simplified archaeal community in biosolids, which is susceptible to environmental perturbations. Therefore, one possible odor control strategy is the preservation and enhancement of the methanogenic population during biosolids storage.