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Characteristics of leachate in Foot and Mouth Disease Carcass Disposal using Molecular Biology Method

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The Leachate from Foot and Mouth Disease(FMD) carcass disposal by is one of the types of high-concentration contaminated wastewater with the greatest environmental impact. This is due to its pollutants: nitrate nitrogen (NO_3–N) and pathogenic microorganisms. Satisfactory treatment of leachate is not an easy task for its high concentrations of nitrate nitrogen and pathogenic microorganisms. Therefore suitable FMD leachate treatment processes should be adopted to improve treatment performance and to reduce overall running costs. The objective of this study was to determine the leachate characteristics through environmental analysis and molecular biology method (bacteria identification and Polymerase Chain Reaction) using FMD leachate samples for optimal FMD leachate treatment processes. The Sixteen FMD leachate samples was obtained from carcass disposal regions in Korea. Results of environmental analysis showed that pH and Eh was observed from 5.57 to 7.40, -134∼358mV. This data was exhibited typical early carcass disposal (Neutral pH and Reducing Environment by abundant organic matter). TOC and nitrate nitrogen high concentrations in FMD leachate showed a large variability from 2.3 to 38,730 mg/L(mean – 6,821.93mg/L) and 0.335 ∼231.998mg/L(mean – 37.46mg/L), respectively. The result of bacteria identification was observed Bacillus cereus, Pseudomonas putida, Acinetobacter ursingii, Aeromonas hydrophila, Serratia liquefaciens, Brevundimonas naejangsanensis, Serratia liquefaciens, Pseudomonas fluorescens, Pseudomonas aeruginosa, Acinetobacter ursingii. The results of Polymerase Chain Reaction(PCR) using EzTaxon server data revealed Pseudoclavibacter helvolus, Pseudochrobactrum saccharolyticum, Corynebacterium callunae, Paenibacillus lautus, Paenibacillus sp., Bacillus arvi, Brevundimonas bullata, Acinetobacter ursingii, Lysinibacillus sphaericus, Bacillus pumilus, Bacillus sphaericus, Bacillus psychrodurans, Pseudomonas sp.