Pandaree Katawee 2009: Aerobic Composting of Winery Wastes by Thermophilic Hydrolytic Microorganisms. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Science. Thesis Advisor: Assistant Professor Jukkrit Mahujchariyawong, Ph.D. 118 pages.

The co-composting of grape marc with livestock manure and grass trimming was considered as an effective method for treatment of solid winery waste. Addition of thermotolerant hydrolytic microbial inocula improved degradative activities of organic materials during thermophilic phase. Initially, hydrolytic microorganisms were screened. Four amylase producing-isolates designated as ST1, ST2, ST3, ST4 and three caseinase-producing isolates SK1, SK2 and SK 3 were obtained. These strains were used to formulate 5 effective microbial communities, namely EMC1-EMC5. After investigation, EMC3 and EMC5 were selected to be used as inocula for grape marc co-composting. Their effectiveness was compared with the use of commercial inoculum and without microbial addition. The results show that both inocula demonstrated comparable performance to commercial inoculum. At initial C/N ratio of 30, EMC3 and EMC5 reduce C/N ratio to 18.24 and 17.56, respectively at the end of experiment, while C/N ratio of 17.91 were obtained from using commercial inoculum. On the other hand, grape marc co-composting exhibited C/N ratio of 19.07 under natural condition without external microbial addition. The composts produced from grape-marc contained sufficient amount of essential elements required by standard. Matured composts were subjected to Germination Index (GI) analysis which no inhibitory effect was observed. EMC5 exhibited highest GI value of 122.89%. When applied to *Brassica pekinensis* plots, grape-marc compost promoted the growth of plants better than any commercially-available composts tested. Therefore, the addition of EMC facilitated the degradation of organic materials and produced high quality compost with high potential of large-scale application.

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