Effective Quantification of EM with Highly Specific and Sensitive qRT-PCR

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Effective microorganisms (EM) is a mixed culture containing more than 80 kinds of anaerobic or aerobic microbes including photosynthetic bacteria, lactic acid bacteria, yeast, actinomycetes, fungi. EM is increasingly gaining attention because of its wide variety of applications such as organic farming, agriculture, live stock industry, environment and even medicine. But its effectiveness varies with the ratio of the main genera. Thus, quantitative analysis of EM is essential for the applications of EM. To produce and use EM efficiently in wider applications, the quantitative analysis and the modeling of mixed culture EM system are required. In this study, we were able to quantify EM at high sensitivity and specificity with the help of quantitative real-time PCR. Using selected primers, photo synthetic bacteria, lactic acid bacteria and yeast which are the major components of EM were amplified by PCR. To confirm the viable cell count ability of qPCR, agar plate cell count was carried out showing linear relationship with compared qPCR experiments. This indicates results that the PCR-based system provides a highly specific and sensitive tool for the quantification of EM.