

[DOI: 10.20472/IAC.2019.051.018](https://doi.org/10.20472/IAC.2019.051.018)

JUNGHEE LEE

Gyeonggi-do Institute of Health and Environment, South Korea

STUDY ON THE IMPROVEMENT OF THE ENUMERATION OF LEGIONELLA IN ENVIRONMENTAL WATER SAMPLES USING REAL-TIME PCR

Abstract:

The standard method for the enumeration of environmental Legionella has several drawbacks including long incubation and poor sensitivity. The purpose of this study was to compare the result of culture and real-time PCR on detecting Legionella and to evaluate the usefulness of real-time PCR alongside traditional culture for enumeration of Legionella from water samples. The real-time PCR assays conducted to quantify Legionella spp. (16S rRNA gene) and *L. pneumophila* (mip gene). Each real-time PCR assay had 100% specificity and excellent sensitivity (5 GU/reaction). Legionella was enumerated in 200 environmental water samples. In the culture, 36 samples were positive and 164 samples were negative. Based on the culture, real-time PCR was a high negative predictive value of 99%, 35 samples were true positive, 105 samples were true negative, 59 samples were false positive and 1 samples were false negative. Quantitative analysis of the two methods showed a weak linear correlation ($r^2=0.29$, $r^2=0.61$, respectively). Real-time PCR analysis showed weak linear correlation ($r^2=0.29$, $r^2=0.61$) with the culture-based results. Although it is difficult to directly apply quantitative analysis results of real-time PCR in the enumeration of environmental Legionella, it can be used as a complementary means of standard methods to rapidly screen negative samples and to more accurately diagnose.

Keywords:

environment, Legionella, real-time PCR, culture

JEL Classification: I19, L65, O39