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PORNTIP KHAMOUN : DEVELOPMENT OF A METHOD FOR
CONCENTRATION OF ROTAVIRUS AND ITS APPLICATION TO RECOVERY
OF ROTAVIRUS ANTIGEN FROM WATER. THESIS ADVISORS: LEERA
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A modified adsorption-elution method for the concentration of rotavirus from water was developed for this study. Various factors such as types of filters, eluents and reconcentration methods were varied and the results compared. An enzyme-linked immunosorbent assay was used to determine the recovery of rotavirus antigen. After 3 eluents were compared in negative charged filtration and reconcentration by speedVac concentration, 0.05 M glycine, pH 11.5 gave the highest rotavirus antigen recovery of $56.59 \pm 2.66\%$ (mean \pm SD) followed by 2.95% TPB+6% glycine, pH 9.0 ($41.22 \pm 13.58\%$) and 3% BE+0.05 M glycine, pH 9.5 ($37.57 \pm 5.27\%$). By positive charged filtration, lower recoveries of rotavirus antigen were observed. Whatever eluents used, reconcentration by polyethylene glycol (PEG) precipitation gave lower recoveries than speedVac concentration. After data analysis, the interaction between types of filters and reconcentration methods was found. By speedVac concentration, the virus recovery was significantly higher than by PEG precipitation in both negative charged filter ($45.13 \pm 11.44\%$ vs $18.45 \pm 4.38\%$, p -value < 0.001) and positive charged filter ($29.44 \pm 6.62\%$ vs $16.85 \pm 3.83\%$, p -value < 0.001). In addition, speedVac concentration in negative charged filtration resulted in significantly better virus recovery than positive charged filtration ($45.13 \pm 11.44\%$ vs $29.44 \pm 6.62\%$, p -value=0.004). The rotavirus concentration method using negative charged filter, 0.05 M glycine, pH 11.5 and speedVac concentration was applied to detect rotavirus from environmental water samples. Thirty eight water samples were collected from the river, canal, domestic sewage systems, containers which held tap water for drinking and domestic uses and commercial drinking water bottles. MPN of coliforms and fecal coliforms /100 ml water were found to be 0->1,800 MPN/100 ml in almost all samples and coliforms and fecal coliforms were not present in all commercial drinking water. Nevertheless, the rotavirus antigen was not detected in any samples.

This study suggests that the optimal condition of adsorption-elution technique is the use of negative charged filter, each of 3 eluents and speedVac concentration. The concentration method developed in this study can be used in monitoring the virological quality of drinking and environmental water for the prevention and control of acute rotaviral diarrhea and epidemiological study of rotavirus in the environment.