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Application of Colimínder® technology for rapid detection of bacterial contamination in water: Practical examples and case studies

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Vienna Water Monitoring (VWM) develops and manufactures instruments for microbiological water quality testing and control. The devices of ColiMinder® series are able to detect microbial contamination in water using metabolic activity methods, specific for *E. coli* (Beta-Glucuronidase activity), total coliforms (Beta-Galactosidase activity) and total microorganisms (Alkaline phosphatase activity). Major advantages are fast, reliable results within few minutes and a fully automated measurement routine. The broad range of various practical examples will be present and analyzed: long-term outdoor monitoring of surface water quality; efficiency of ozonation, UV irradiation and flocculation processes for raw water treatment and disinfection; monitoring of microbial contamination in industrial water (fruit washing line) and technical water for oil and gas industry. In preliminary practical tests, fluctuations of microbial contamination tracked with a previously impossible time resolution (30 min), give insights into development and abatement of microbial contamination. The technology can be used both for water quality monitoring purposes and for process control applications.

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Efficacy assessment of the ecological purification system use in Fiji

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Treatment of drinking water is an integral aspect of the World Health Organization (WHO) regulations. This continues to be a challenge for developing countries like Fiji where a considerable number of rural residents lack access to treated public water supply, evident from the re-emergence of typhoid cases in 2014. The present study has been conducted to assess the efficacy of the Japanese water intervention called the Ecological Purification System which is used in some settlements of Fiji. The EPS is a modification of the traditional Slow Sand Filtration System with more emphasis on biological components such as algae, sunlight and oxygen as the added modes contaminant removal from water. The study compares levels of total coliform, *E. coli, Salmonella*, TSS, BOD and pH in 100 ml of water before and after treatment by EPS. After treatment, data analysis showed that 98% of the samples had non-detectable levels of E. coli where 50% of the water samples had E. coli ranging from 4-500 CFU/100 ml before treatment. Significant removal (P=0.03; 98% removal) of total coliform was also noted. TSS removal was insignificant (P=0.632) with significant decrease in pH (P=0.02) and insignificant difference to BOD (P=0.35) in the water after treatment. Preliminary detection of *Salmonella* was proved to be a false positive by confirmation tests. Hence, EPS is an effective device for removing coliform from water to safe levels. EPS effectiveness however, may vary depending on coliform population, contamination level of water, climatic patterns that may alter algal growth and the maturity and microbial population of the schmutzdecke (bio-layer).

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