

Earns Doctorate for Research into Ceramic Filter to Reduce E.Coli Bacteria

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Biological water pollution can cause health problems, such as diarrhea, worm infections, dysentery, cholera, typhoid and liver. While the chemical water pollution can cause health problems, including skin infections, intestinal disorders, liver diseases, bone disorder, circulatory system, anemia, central nervous system damage and carcinogen problems.

Ariyanto Nugroho, SKM, M.Sc, professor of Public Health Study Program, Respati University, said that the water quality that is considered safe to be consumed is clear, colorless, odorless, tasteless, free of microorganisms that cause infection and free of harmful chemicals. Therefore, one of the main parameters related to the quality of water to be considered is the biological parameters.

"Analysis of biological parameters is typically using microorganisms indicators, namely Escherichia coli (E. coli) or fecal coli," he said at the Senate hall of Faculty of Medicine UGM, Friday (11/11) at his open examination of doctoral program.

Ariyanto Nugroho stressed that E.coli is always present on the feces so that it can be an indicator of pollution, whether it comes from the feces of humans or warm-blooded animals. Therefore, based on

ministerial regulations Permenkes 492 / Menkes / PER / IV / 2010, the score of Most Probability Number (MPN) E. coli should be zero.

Related to this, said Ariyanto, variety of methods is developed in order to overcome problems related to microbiological contaminants in drinking water. One way that is easy to apply is by filtering the water.

The existence of water filter manufacturer in Indonesia certainly has many benefits. These benefits are not only water purification to meet the physical quality, but also microbiological contamination reduction to safe level for consumption.

Ariyanto described a ceramic filter works by pouring raw water from rivers, lakes and others into the filter. Water is dripped from the filter into a plastic fence and can be used as drinking water.

"To reduce the microbiological contamination in several countries, ceramic filters are combined with silver so that it serves as a bactericide," he explained.

Defending his dissertation entitled *Effectiveness of Various Dosage and method of Silver Nitrate (AgNO₃) Application On Ceramic Filter against Bacteria Escherichia Coli In Water*, Ariyanto Nugroho described the use of silver itself is one of the innovations in the provision of clean water. From various studies conducted in laboratory, silver ion acts as an antibacterial.

Such a ceramic filter applications in private households in Bolivia showed reduced diarrheal diseases for about 70 percent compared with households that do not use the ceramic filter. While in Cambodia, the ceramic filter can reduce E.coli average of 99 percent, both in laboratory and in field trials.

From these results, said Ariyanto, applied ceramic filter allows people to cultivate and maintain the microbiological quality of their drinking water. In addition, the ceramic filter price is affordable by low-income communities.

"Therefore, in this dissertation researcher is interested in reviewing the doses and methods of application of silver nitrate (AgNO₃) on a ceramic filter. Although research related to bactericidal effect of silver against bacteria have been conducted many times, but for a study evaluating the dose and the method of adding a silver in the ceramic filter to get the most effective results in reducing E. coli has not been done," he said.

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