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Programme and Abstract book

Counting, "organelles" and fragments of protozoa, a fast and simple method to control the activity of protozoan in the cooling towers

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Aims

Most of the monitoring related to the risk of Legionella that are performed on the cooling towers is chemical or bacteriological control rarely the control of the activity of protozoa. The Legionella grow in association with their hosts protozoa. With a quick and simple method to control the activity of protozoa we could expect to anticipate an episode of proliferation of Legionella.

Methods

Measurements were done each week during four months in a plant with two different cooling tower circuits. The make up water is the same for the both circuits and is pumped in a river. At first a risk analysis of each the circuit was done and sampling points were chosen downstream of each sensible elements.

The protocol for sampling and analysis is as following. 100 to 500 ml of water is sampled, then filtered with filters with a successively porosity of 20µm, 5µm and 1.2 µm. The 1.2 µm filter is treated with gentamicine to kill free bacteria then after to be rinsed with TBSS solution.

Sonication is used to resuspend in a TBSS solution, from the filter, objects to be observed. The cell of Malassez is used to count the objects under the microscope.

At first, all spherical objects between 1.2 µm and 5 µm that look like organelles of protozoa were counted. Then, all objects like vesicle containing " Legionella-like-structures " and pieces of dead protozoa were also counted.

Results

Counting the "organelles" showed how a significant quantity of protozoa should arrive inside the two circuits, coming from the river, when its temperature exceeded thirteen degrees Celsius. Counting objects like vesicle containing Legionella-like-structures shows a short episode where the river provide the circuits with these objects and that some elements of the circuit might promote the development of protozoa. Counting the pieces of dead protozoa, shows an important phase of mortality of protozoa in one circuit and two in the second.

Conclusions

This study performed shows that Counting, "organelles" and fragments of protozoan, gives a some indication of the activity of protozoa. This should allow: to chose where on the circuit it's the most interesting to perform the monitoring, and know when the chemical controls, the bacteriological controls and the bactericide treatments should be reinforced.

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