

Comparison of water samples and swab samples for the detection of environmental *Legionella pneumophila* and *Legionella* spp. by culture and qPCR



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Background:

Water collection has been the recommended sample for the detection of environmental *Legionella* spp. and *L. pneumophila* by cultural and molecular tests. The Copan SRK[®] environmental collection kit, a FLOQSwabs[®] and a 2 ml medium tube, has been previously validated for *Legionella pneumophila* viability up to 48hs at RT and 72hs at 2-8°C by culture and by PCR with different molecular assays.

Objective:

The objective of this study was to compare water samples to swab samples collected at the water source with the SRK[®] environmental collection kit for the detection of *Legionella* spp. and *Legionella pneumophila* by culture and qPCR.

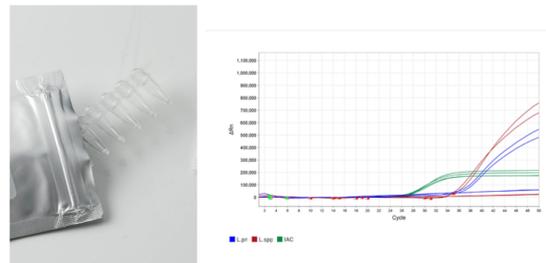
Materials:



SRK[®] kit
Tube with 2.5 ml of medium
and a FLOQSwab[®]



qualyfast[®] Legionella qPCR assay

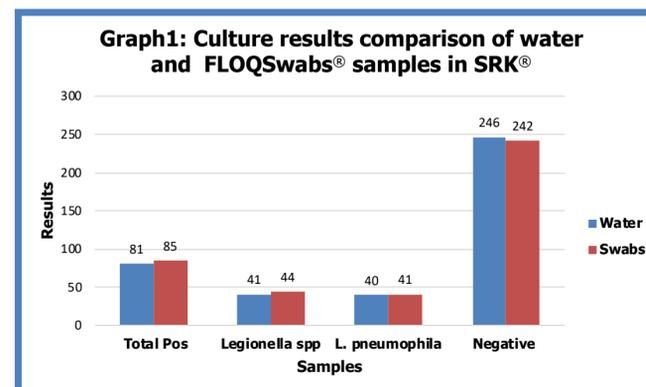


Methods:

- Water and SRK[®] swab samples (N= 331) were collected in duplicate from 79 wells, 261 house water and 4 cooling towers.
- Two liters of water were collected and SRK[®] sampling was performed by swabbing the water source with the FLOQSwab[®] and storing it the in the SRK[®] medium tube.
- Water, 1 liter was processed for culture as per SOP based on the ISO 11731:2017, while the other liter was filtered, nucleic acids extracted using the DNA Extraction Kit I (Bioside) and analyzed with the qualyfast[®] Legionella qPCR assay (Bioside) for simultaneous detection of *Legionella* spp. and *L. pneumophila*.
- The SRK[®] samples were vortexed and 200µl was plated on BCYE agar plates and incubated at 37°C for 10 days, while nucleic acids were extracted from 200µl of SRK medium. Purified samples was analyzed with qualyfast[®] Legionella qPCR.

Results:

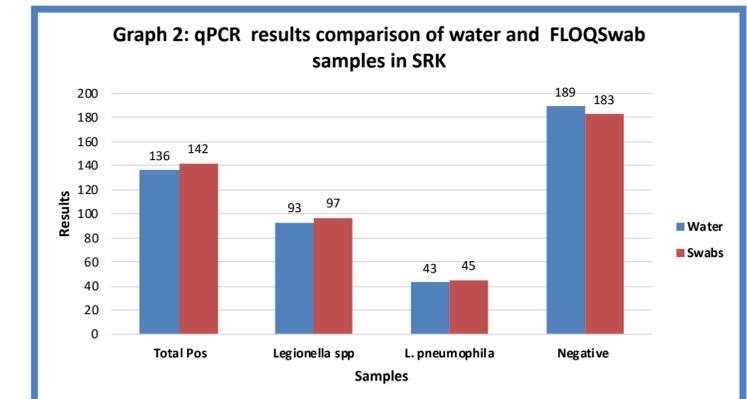
In the 331 water and SRK[®] swab samples (Graph 1) culture detected 81 positives (41 *Legionella* spp., 40 *L. pneumophila*), 246 negative, and 4 discordant, 4 SRK[®] positive (3 *Legionella* spp., 1 *L. pneumophila*), water negative with 100% positive agreement (PPA), 98.79% overall rate agreement (ORA) with 0.928 p-value.



Results:

The qPCR detected (Graph 2) 136 positives in both sample types (93 *Legionella* spp., 43 *Legionella pneumophila*), 189 negatives and 6 discordant, 6 SRK positive (4 *Legionella* spp., 2 *L. pneumophila*) and water negatives with 100% PPA, 98.19% overall rate agreement (ORA), with 0.894 p-value.

Less inhibition was present in the SRK purified samples compared to the water tested with qualyfast[®] Legionella qPCR assay.



Conclusions:

Data obtained in this study demonstrated that the Copan SRK[®] environmental collection kit detected the same number of *Legionella* spp and *Legionella pneumophila* when compared to water samples by culture and qPCR with qualyfast[®] Legionella assay.

SRK[®] environmental collection kit is easy to process compared to water bottles and allow left over sample for repeat testing.

The combination of the Copan SRK[®] kit for sample collection and qualyfast Legionella PCR kit for Legionella detection are an added advantage especially since both can be transported and stored at room temperature.