



# Detection of airborne virulent bacteriophage of dairy starter culture in a cheese factory



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## Context

**Phage infection** of *Lactococcus lactis* (commercially important bacterium used to make fermented dairy products) during fermentation of milk **is a troublesome and persistent economic problem** in factories where **fermented dairy products** are produced such as in cheese factories.

In this study, the concentration of the lactococcal 936-species bacteriophages was evaluated in aerosols collected in a cheese factory with different sampling techniques: either filters (polycarbonate and Teflon) or liquid sampling (Coriolis® and BioSampler).



## Material

- Coriolis®µ, sterile cones.
- BioSampler (SKC).
- Liquid: Sterile water+ 0.01%Tween20.
- PC (Polycarbonate) filter on 37 mm cassette.
- PTFE (Teflon) filter on 37 mm cassette.
- Real time PCR.



## Protocol

- Coriolis®µ (n=5): 3 x 10 minutes; 300 L/min.
- BioSampler (n=6): 20 min, 12.5 L/min.
- PC and PTFE filters (n=6): 12 hours; 2 L/min.
- Real time PCR (SYBR Green) : number of phage genomes per cubic meter of air.

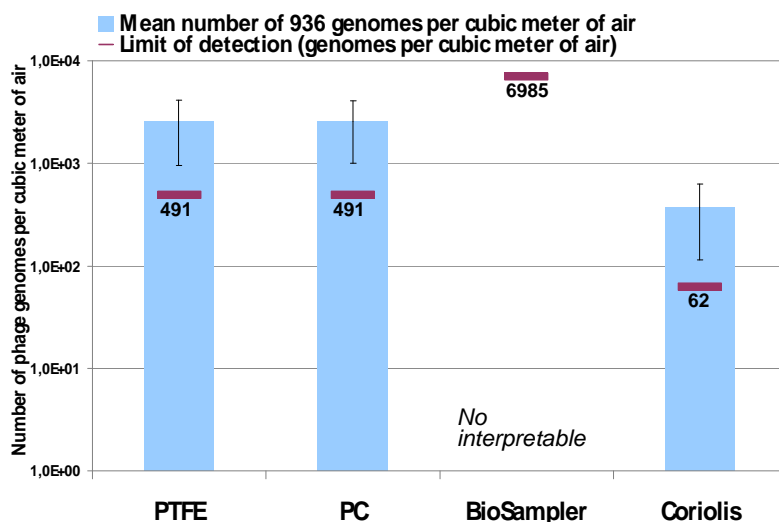


## Results

**Coriolis®µ:** Conclusive result with a fast sampling (30 minutes) and a **limit of detection 8 to 113 times better** than other samplers.

**PC et PTFE filters:** Conclusive results (above the limit of detection); the time of sampling (12 hours) is still a restrictive step.

**BioSampler:** Inconclusive results (limit of detection).



## Conclusion

The **Coriolis®** is an efficient air sampler to **detect low concentration of airborne virulent bacteriophage in the air**. Furthermore thanks to its ergonomic design, the use is easy in industrial area such as cheese factories. In both **industrial and epidemiological context**, short time sampling (high air flow rate), efficiency and its ergonomic design are important assets to detect airborne contaminants and to react as soon as possible.

