



FREE-LIVING AMOEBAE AND LEGIONELLA IN BIOAEROSOLS FROM COMPOSTING FACILITIES

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/ CONTEXT

Legionella bacteria are the causal agents of the Legionnaire's disease, a severe form of pneumonia. *Legionella* is present worldwide in natural freshwater environments and human warm water systems. The bacterium was also isolated in soils, potting soils and composts. *Legionella* multiplication in amoebae was demonstrated using co-cultural methods.

The aim of this study was to investigate on the simultaneous presence of amoebae and *Legionella* in the compost piles and in the bioaerosols developed from pile fermentation. Bioaerosols were collected by a Coriolis®µ air sampler. Seven green waste collection centers (composting facilities, or long term storing and short term storing centers) were sampled. [1]

/ MATERIALS

- Coriolis®µ, sterile cones
- Liquid of sampling: PAGE saline

/ PROTOCOL

- Coriolis®µ: 250 L/min, 4 min. sampling (1m³)
- Culture analysis:
 - The protozoa were cultured on non-nutritive agar plates covered with *E.coli* as a food source.
 - *Legionella* spp. were cultivated on GVPC agar plates and by co-culture with axenic *Acanthamoeba polyphaga* for two weeks. [1]

/ CONCLUSION

This study contributes to improve the knowledge about *Legionella* and amoebae. **Coriolis®µ** is an efficient air sampler to collect free-living amoebae and *Legionella* in bioaerosols from composting facilities.

Further studies are needed to investigate the spread of *Legionella* from composts to bioaerosols and the dispersion of these bioaerosols for a better evaluation of the health risk for neighboring population. [1]

/ RESULTS

The aerosols of six centers were positive for *Legionella* spp. after co-culture and two aerosols were positive for amoebae. Amoebae and *Legionella* spp. were isolated from composts of six and four centers, respectively. *L.pneumophila* and *L.bozemanii* were found in composts and detected in bioaerosols hovering over the same compost heaps. [1]



Figure 1: Composting station with released bioaerosol during fermentation of compost heap.

Figure 2 : Coriolis®µ Air Sampler at work over a compost heap.

This study showed that viable amoebae and *Legionella* are both present in composts and bioaerosols.

Composting facilities are possible reservoirs for *Legionella* and amoebae. Amoebae and pathogenic *Legionella* were cultivated from bioaerosols and could be dispersed from composting facilities transported by wind. Composting and gardening could be considered risk activities. [1]

/ CUSTOMER



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