



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

