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ABSTRACT BOOK



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Environmental Microbiology/Microbial Ecology /Microbial Communities - Part III

**EFFECT OF HABITAT DISTURBANCES ON THE POPULATION DYNAMICS OF ALLOCHTHON
LISTERIA MONOCYTOGENES IN SOIL**

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Backgrounds

Soil is in many cases the first stage in the routes of transmission of foodborne pathogens to plant, farm animals, foodstuff and humans as final consumers. Soil is a complex, heterogeneous environment which shelters many organisms such as allochthon bacteria. The persistence of these organisms depends on abiotic factors (temperature, humidity, texture, chemistry) and on biotic interactions, for example competition with native microflora.

Objectives

In this study, we used the foodborne pathogen *Listeria monocytogenes* as model system to investigate how disturbances affect habitat invasion by allochthon organisms.

Methods

Two soils with contrasting abiotic and microbiome characteristics were used. Inoculated soil microcosms were submitted to two cycles of temperature shifts (either increase to 42°C or freezing at -20°C) separated by 20 days of incubation at 20°C. Control microcosms were kept at 20°C. In order to investigate the impact of the indigenous microbiota, similar experiments were run in γ -irradiated, sterilized soil microcosms. Cultivable *L. monocytogenes* were evaluated by plate counts throughout the 40 days incubation. Additionally, soil samples were taken at the start of the experiment and after 20 and 40 days for DNA extraction and subsequent 16SrDNA diversity analysis. Variations of diversity were assessed in non-inoculated microcosms to evaluate the influence of *L. monocytogenes* invasion on the native soil microbiota.

Conclusions

While growth was observed in sterilized soil, the population of *L. monocytogenes* decreased in the other experimental conditions. Results showed that the fate of allochthon *L. monocytogenes* depended on the disturbance regimen. Higher survival was observed in when soil underwent cycles of freezing