

Cystic Fibrosis Research News

Title:

EXTENSIVE CULTIVATION OF SOIL AND WATER SAMPLES YIELDS VARIOUS PATHOGENS IN PATIENTS WITH CYSTIC FIBROSIS BUT NOT *BURKHOLDERIA MULTIVORANS*

Authors:

Charlotte Peeters, Eliza Depoorter, Jessy Praet, and Peter Vandamme

Affiliations:

Laboratory of Microbiology, Ghent University, K. L. Ledeganckstraat 35, 9000 Ghent, Belgium.

What was your research question?

Burkholderia cepacia complex (Bcc) bacteria can cause severe lung infections in people with cystic fibrosis (CF). Of the bacteria within this complex, *Burkholderia multivorans* is the most common cause of infection. We wanted to study exactly where these bacteria come from.

Why is this important?

B. multivorans bacteria are not easily transmitted from person to person and people with CF generally have their own *B. multivorans* strains suggesting that these strains originate from the environment. Although methods which detect bacterial DNA show that *B. multivorans* occurs in many soil and water samples, this bacterium has rarely been grown from such sources. We wanted to compare bacteria grown from human samples to those grown from samples collected from the environment where people with CF live, and learn more about the precise source and mode of transmission of this CF pathogen.

What did you do?

We selected and examined soil and water samples that were previously shown to contain DNA of *B. multivorans*. We tried to grow these *B. multivorans* bacteria from these soil and water samples in a range of ways including in liquid or on solid growth media with different sets of nutrients. We collected all the bacteria which had started to grow and identified them using sophisticated techniques (mass spectrometry [MALDI-TOF MS] and sequence analysis of several genes).

Cystic Fibrosis Research News

What did you find?

Altogether we examined about 1000 bacterial isolates, but *B. multivorans* was not identified. However, we found many other CF pathogens such as *Inquilinus*, *Pandoraea*, *Pseudomonas* and *Stenotrophomonas* species. In addition, we grew several *Mycobacterium* species from the soil and water samples studied.

What does this mean and reasons for caution?

The methods used yielded a surprisingly wide range of bacteria that may cause lung infections in people with CF. Our results show that soil and water are natural reservoirs of these rare but often clinically important CF pathogens. It is not clear why we failed to grow *B. multivorans* since we detected DNA of the bacterium in these samples. Although the presence of DNA does not prove that live bacteria were present, it is unlikely that none of the freshly collected samples harbored viable *B. multivorans* bacteria while all of them comprised its DNA.

What's next?

We aim to develop additional methods to grow *B. multivorans* from soil and water samples. However, the methods used and developed in the current study can be used to study the frequency and distribution of the rare CF bacteria we detected.

Original manuscript citation in PubMed

<http://www.ncbi.nlm.nih.gov/pubmed/?term=EXTENSIVE+CULTIVATION+OF+SOIL+AND+WATER+SAMPLES+YIELDS+VARIOUS+PATHOGENS+IN+PATIENTS+WITH+CYSTIC+FIBROSIS+BUT+NOT+BURKHOLDERIA+MULTIVORANS>