Isolation and Identification of Bacteria from Mercury-Contaminated Soils

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INTRODUCTION

Antimicrobial activity was noted in a local ecosystem contaminated with metals that serve no known biological purpose such as mercury, arsenic, cadmium, and lead (1). Mercury is a heavy metal and has been a subject of both public and private concern, but can enter the water stream because it is used in a variety of manufactured items such as thermometers and fluorescent lights (2). It is now more commonly deposited as a contaminant in waterways and is more likely to be quickly removed from aquatic environments.

The samples were taken from Barnum Court, an abandoned hat factory in Danbury, Connecticut. This mercury-contaminated site served as host to a set of genetically modified trees planted as part of a phytoremediation project. The samples were taken from soil around the roots of genetically modified trees (Figure 1) and from control plots with no trees. In order to identify the most nutritious bacterial heterotrophs, Bacterial communities from each sample were plated onto various media to evaluate colony formation and morphological characteristics, and according to the design of successful phytoremediation that involves plants, this site was ideal for the investigation of bacterial communities able to withstand contaminated environments.

RESULTS, DISCUSSION

The non-selective agar such as Nutrient Agar (designated for organisms that develop quickly and vigorously) and R2 agar (a low-nutrient agar for slower growing cells) yielded results. The samples were taken from Barnum Court, an abandoned hat factory in Danbury, Connecticut. The samples were taken from soil around the roots of genetically modified trees (Figure 1) and from control plots with no trees. In order to identify the most nutritious bacterial heterotrophs, Bacterial communities from each sample were plated onto various media to evaluate colony formation and morphological characteristics, and according to the design of successful phytoremediation that involves plants, this site was ideal for the investigation of bacterial communities able to withstand contaminated environments.

The most well known producer of rhamnolipids is P. aeruginosa. This organism is capable of using a wide range of carbon sources for rhamnolipid production, however, the sources with the highest yield are vegetable-based oils, such as soybean, corn, canola, and olive oil (3). Unfortunately, P. aeruginosa is a human pathogen, and it would be cost prohibitive to maintain the necessary safety procedures to produce the rhamnolipid commercially.

REFERENCES