

Natural clean-up for oil-spill soils

Oil spills from tankers or simply your local garage could soon be cleaned up using specially-selected bacteria, according to research presented today (Wednesday, 06 April 2005) at the Society for General Microbiology's 156th Meeting at Heriot-Watt University, Edinburgh.

Millions of gallons of crude oil and its derivatives used by the plastics and chemical industries are transported vast distances around the world every day, and inevitably some of it gets spilled. Scientists from University College Dublin are studying how natural bacteria can be used to tackle these pollutants.

"We looked at soil exposed to one of the main components of diesel fuel to see whether the hundreds of different micro-organisms in the site could break down the hydrocarbon, and to find out which bacteria in the natural community were involved," says John Reynolds from the Department of Industrial Microbiology at University College Dublin. "Although we know that microbes do degrade these chemicals, we know very little about how this happens in real ecosystems. This has been because until recently, methods were not available to really analyse what happens to microbial populations actually in the soil." "Each gram of soil has hundreds of different species of microbes in it," explains John Reynolds. "Using advanced DNA profiling we showed that there was a big change in the balance of different bacteria in the community during the process, which allowed us to pin-point those bugs which actively respond to the hydrocarbon."

Conventional clean-up procedures such as incineration, used when crude oil or one of its hundreds of carbon based components is spilled, are expensive and environmentally damaging. The work by the Dublin based scientists showed that some of the constituents of diesel oil are toxic to some bacteria, but others can use it as a food, breaking it down in the process, and that then different bacteria could use the results to further destroy the pollutants.

"Potentially there are enormous benefits through understanding how natural microbial populations can be manipulated to break down pollutants," says John Reynolds. "Simply adding a degrading bug to polluted soil doesn't work as a clean-up method. It's the communities that matter. This information should allow us to choose a set of specific bacteria and rationally design a remediation and rescue package for any oil contaminated site in the real world."