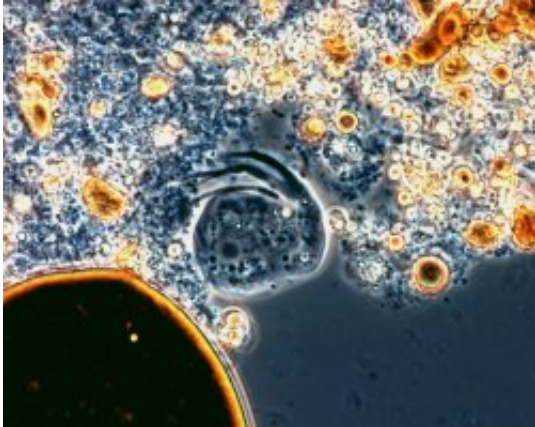


A natural tool to tackle oil spills?

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(PhysOrg.com) -- Marine bacteria could be the key to cleaning oil spills in the sea, without further damaging the environment by using chemicals, according to microbiologists at Bangor University.

In the future, we could be harnessing naturally occurring microbes and fertilizing them to increase their capacity to digest oil. These microbes are found in [seawater](#) all over the planet. They naturally occur on [microscopic algae](#). Their numbers are regulated by the amount of their food source and certain nutrients that they need to thrive.

The microbiologists at Bangor University are the first to trial this theory in a systematic experiment, using seawater collected from the North Sea, the Irish Sea and the Mediterranean. Their early results are strikingly

similar- suggesting that the system could be effective in a wide range of locations.

"The oil spill is an alternative digestible 'food source' for these microbes. Although probably present in the Gulf of Mexico, for example, a shortage of other essential nutrients limits their growth in numbers," explains Christoph Gertler, of the School of Biological Sciences.

"What we have trialled is adding the nutrients these organisms need in the form of a [fertilizer](#), in a containing boom, for example. This enables the [microbes](#) to multiply and, in the process, to break down and digest the [pollutant](#)," he adds.

"Initially, we used the heaviest and most complex oil to biodegrade in small scale experiments of 500 mililitres and managed to remove 95% of it simply by applying these bacteria. In a second step, we scaled up the experiment to 500 litres and managed to remove virtually everything with the help of both bacteria and an oil absorbing material. The next step would be to test the method in the field on an actual oil spill as soon as possible."

"The potential for 'bioremediation' as this technique is called is huge. It is, I believe, the only technique that would effectively remove oil that is distributed over such large distances as are being seen in the current [Gulf of Mexico](#) oil spill."

"Generally speaking, only collecting ("skimming") the oil from the water surface, in-situ burning or biodegradation removes the oil from the ecosystem. Dispersants only distribute it nicely."

Professor Golyshin explains: "The microbe used in the experiments -- *Alcanivorax borkumensis* -- is extremely well adapted to oil degradation. It lives solely on oil and dies after consuming all oil in its surrounding.

Although it is effectively able to survive and function in a range of temperatures above 5° C, there are bacteria which perform this job in the Polar Zones, too. Bangor University also investigates *Oleispira antarctica* which degrades oil in seawater at freezing point."

He added, "Experiments in the lab have shown that -- given good growth conditions - the bacteria initiate oil degradation very quickly within a week after the oil spill and finish it within two months."

Provided by Bangor University

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