

Rhamnolipid, a naturally produced oil dispersant, may improve oil spill remediation

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Abstract

Oil spills have devastating effects on the environment, and thousands, of varying size, occur each year. Spilled oil can be removed from the environment in numerous ways, such as with the use of dispersants to break up oil slicks on the water surface. But while oil spills themselves pose well-known threats to marine life, the methods used for oil cleanup can also have unintended consequences. To examine these effects, researchers recently investigated how treatment of oil with dispersants produced synthetically (Finasol) and by bacteria (rhamnolipid) impact microbial communities and their ability to break down oil from the subarctic Atlantic Ocean. They found that cold-loving bacteria initially dominated the bacterial communities when both dispersants were used, but some key species of bacteria that specialize in breaking down aromatic hydrocarbons, which are the major and most toxic components of crude oil, became abundant over time in only the presence of rhamnolipid. These bacteria were not observed at all when Finasol was used, and this synthetic dispersant had an overall negative effect on microbial biodiversity. While these results were obtained under laboratory conditions, they indicate that rhamnolipid, the more biodegradable and less toxic of the investigated dispersants, may offer an advantage over Finasol, providing valuable guidance for the future use of these dispersants in oil spill remediation.