Isolation of a Novel Marine Microorganism Capable of Aromatic Hydrocarbon Degradation in East Hawai‘i

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Oil spills have been a pressing environmental problem since the early 20th century due to the plethora of difficulties encountered when attempting to clean up the substance and its constituent aromatic hydrocarbons. The use of bacteria in remediating such an oil spill presents a major risk; if an imported bacteria begins to show invasive properties, even more strain is put on the already-taxed environment. Thus, it becomes imperative – especially in Hawai‘i, where many species are endemic and susceptible to alien competition – that local, non-invasive microorganisms capable of degrading aromatic hydrocarbons be found for use in potential oil spills around Hawai‘i. In this study, soil samples were collected at three coastal locations in East Hawai‘i and assayed for candidates using primers generated by known hydrocarbon degraders. One location out of the three exhibited such traits, and its constituent bacteria were then isolated on different types of media by aseptic culturing methods; out of these isolates, two bacteria grown on marine agar exhibited the traits of sulfate-reducing bacteria (SRB), many of which are well-established hydrocarbon degraders. The actual degradation ability was then confirmed through successful growth of both isolates on two types of modified marine agar that utilized hydrocarbons – one catechol and the other engine oil – as the sole carbon source, which would preclude the growth of microorganisms incapable of hydrocarbon degradation. From these assays, it is apparent that at least two preexisting, marine bacteria capable of metabolizing both simple aromatic and complex long-chain hydrocarbons are present in East Hawai‘i.

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