Journey From Sewage Sludge to Fertiliser With Pseudonomas Luteola

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The water we use in daily life, is collected and transported to the treatment plant. Sewage Sludge is separated from the water as a result of physical, chemical and biological treatment. Despite the fact that these sludges are used as fertiliser in agriculture due to the very high organic substances and micro-macro nutrients in their content; because of heavy metals they contain, this usage is restricted by most countries. We aimed to remove heavy metals on Sewage Sludge. It was our starting point.

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It has been published that Pseudomonas luteola absorbs heavy metals such as lead, copper and so on (Keloğlu, 2019; Özbucak, 2018; Önal, 2007). Absorbed heavy metals break down in the cell and lose their effectiveness. As a result of the experiments, we expected a decrease in heavy metals and an increase in iron element. Pseudonomas luteola contains iron as it is a cytochrome C type bacterium. As the bacteria multiply, the amount of iron around increases. We did 3 different experiments to get the right result.

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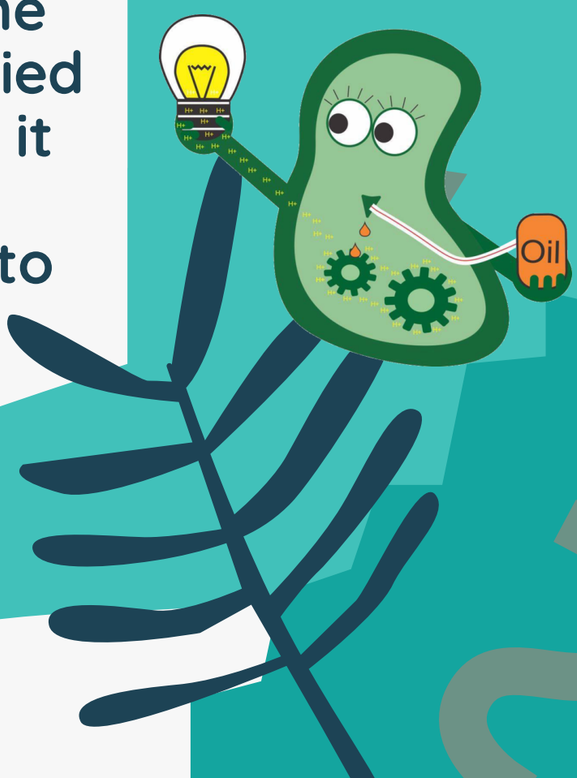
As a result of our experiments, Cu 86%, Al 83%, Zn 70%, Cr 32%, Pb 62%, As 47% removal were achieved. As we expected, Fe increased by -132%. These results show that bacteria can multiply in the environment with the increase in iron, while the decrease in heavy metals shows that the bacteria work as expected. Heavy metals have been largely absorbed from the treatment sludge, which cannot be used in agriculture due to the heavy metals it contains. In this study, it has been proven that pseudonomas bacteria can reproduce and maintain their functionality in sewage sludge, which is the waste of city wastewater. Our studies were carried out on 0.4 L of sewage sludge. For this reason, it should be tested on thousands of liters of treatment sludge in treatment plants. We aim to cooperate with municipalities in the future.



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