



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Ayushi Srivastava	Project Number S1123
Project Title The Milkweed Mesh: Cleaning Up Oil Spills in Aquatic Environments Using an Eco-Friendly Component	
<p style="text-align: center;">Abstract</p> <p>Objectives After horrific oil spills, think of a tainted image of minimal access to sunshine and prime gateways to deadly industrial chemicals for aquatic wildlife. In today's day, companies use an increased amount of compounds and bacteria to clean up their oil messes. These establishments do not belong in aquatic ecosystems and cause more harm than good. An eco-friendly solution, that is able to absorb industrial oil to clean the surface effectively without causing a chemical disturbance to wildlife, must be found.</p> <p>Methods Consumable materials include Milkweed plants (separated flowers and leaves), Water Spangles (Salvinia minima), and Dwarf water lettuce (Pistia stratiotes). The specific treatments include Cooking oil(Kirkland Oil to mimic a high viscosity substance for observation), water as constant and Petroleum (to imitate potential industrial oils). Software 3D Imaginer System: TINKERCAD is used to create an online prototype.</p> <p>Results Milkweed's seed pods' absorption rate for petroleum was 0.1oz/24 hours with a 0.04oz sample. For standard cooking oil, this rate of absorption was 0.15oz/24hrs. It absorbed negligible amounts of water. Overall, Milkweed's hydrophobic, cellulose-based seed pod fibers are greatly oil absorbent in comparison to the rates of other plant materials.</p> <p>Conclusions If Milkweed's seed pods and fibers can be inserted around tubes made up of polypropylene and mashed into a heavy paste to be laid throughout the net with the presence of water, then seed pods can repel water to attract the petroleum. This product could then be lifted once completely saturated and replaced with another mesh net to gather the crude oil up from the surface for proper disposal. As of now, there is no approved, fully eco-friendly method of oil spill clean up making this new research. It is incredibly important that wildlife is put as the priority when the environment comes into question and this mesh net aids in doing exactly that.</p>	
Summary Statement After observing the chemicals and harmful bacteria that are used to paradoxically "clean" water surfaces after oil spills, I used Milkweed's seed pods to create an eco-friendly mesh net that will absorb & recycle oil from the spill scenes.	
Help Received I spoke with UC Berkeley Alumni to direct my research on the creation of my online prototype of the mesh net. I also took the help of my dad while experimenting because the majority of my data collection was at home and required adult supervision.	