



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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| Name(s) Makena Bailey; Kyra Phaychanpheng | Project Number J0503 |
| Project Title Fruit Forensics: Extracting DNA from Fruits Using Different Cell Lysis Buffers | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our objective is to learn how to extract deoxyribonucleic acid (DNA) from fruits and to determine which fruit yields more DNA and which soap solution helps the fruits precipitate more DNA. We were inspired to extract DNA from different fruits because DNA is in all living organisms. There is also so much to explore about DNA. Our hypothesis states that strawberries will produce more DNA than the raspberries and bananas, while the dish soap in the Cell Lysis Buffer (CLB) will cause more DNA to be extracted compared to the laundry detergent and shampoo.</p> <p>Methods/Materials To extract DNA from strawberries, raspberries, and bananas, we need to use a special technique using CLB, which breaks down the cell membrane. We tested three fruits, with three CLBs, three times each. We used strawberries, raspberries, and bananas with laundry detergent, dish soap, and shampoo in the Cell Lysis Buffers. In all we performed 27 tests. We prepared the CLB that is made of water, salt, and our first chosen soap, then we smashed our first fruit into a paste. Next, we mixed 10g of fruit paste and 10mL of CLB together. We strained the mixture through gauze cloth then slowly layer ethanol on top of the fruit/ CLB mixture. As soon as the DNA appeared, we extracted it and put the DNA into centrifuge tubes. We weighed the centrifuge tube with the DNA in it.</p> <p>Results We found that the raspberries produced the most DNA with an average of 0.21 grams, and bananas produced the least DNA with an average of 0.089 grams. Also, we found that the dish soap caused a greater amount of DNA an average of 0.164 grams to be extracted. For the different soaps in the Cell Lysis Buffer, the dishwashing soap caused the greatest amount of DNA to be extracted from the fruits. Although the dish soap caused the most extractable DNA, laundry detergent was only 0.003g less.</p> <p>Conclusions/Discussion Our hypothesis was partially supported and partially not supported. Our hypothesis was not supported because we assumed the strawberries would produce more DNA, but raspberries produced more DNA. Our hypothesis was supported because dish soap caused the most DNA to be extracted. In conclusion, we learned more about DNA and how it is essential for all living things. We also learned a procedure and techniques how to extract DNA. This experiment will help others (and us) to understand more about genetics and biotechnology.</p> | |
| Summary Statement We extracted DNA from strawberries, raspberries, and bananas using different soaps in the cell lysis buffer. | |
| Help Received None. We performed the experiments ourselves. | |