Extracting DNA from Bananas and Strawberries

Purpose:

To properly and successfully extract DNA from various fruits using cell disruption and separation techniques.

Materials Used:

2 heavy duty zip-lock baggie
1 strawberry (fresh or frozen and thawed) or
1 banana half
10 ml DNA extraction buffer*
Cheese cloth for filtering
Contact Lens Solution
Ice cold 95% ethanol
1 small beaker
2 Test tubes
Wooden coffee stirrer

*To make the extraction buffer, 100 ml of shampoo (without conditioner) was mixed with 15 g of NaCl and 900 ml of water.

Procedures Used in Experiment

Once all materials are gathered by group members, each individual group should begin the experiment. The first step is to place the strawberry or banana in a zip lock bag and smash the strawberry/banana for 2 minutes. The strawberry produced enough juice and water based substance that no added water was needed, however the banana may not produce as much juice and a small amount of water is added. The next step is to add 10 ml of the extraction buffer to the bag.**[?]** This adds even more water based substance to the bag of mashed fruit. The bag is then mashed again for one minute to mix in the buffer solution with the existing smashed fruit. Once the minute is up, the cheese cloth is folder into a few layers and placed on top of the beaker to

filter the solution into the beaker. The solution is filtered to remove seeds and cell debris such as cell membranes, organelles, proteins, and cell walls allowing only the DNA and small cell debris to filter through. The filtrate, or filtered solution from the bag, is then placed into a test tube. The test tube is filled approximately 1/4 full. Add a few drops of the contact lens solution to the test tube.**[?]** Ice cold alcohol is gently poured into the tilted test tube until the level of the tube was ½ full.**[?]** A distinguished difference in the solution is noticeable consisting of three parts. In the bottom of the tube existed the cell solution and is a red or yellow color. The alcohol is suspended above the cell solution and is clearer. Inside the alcohol solution the precipitated DNA is visible as mucus like substance. Using the wooden coffee stirrer, the DNA can be spooled out of the solution. All of the above steps are completed in the same manner for the banana DNA extraction except for the adding of water during the smashing of the fruit.

Place a very small sample of the extracted DNA on a microscope slide and place one drop of Aceto-orecin stain on the sample.**[?]** Leave the stain on the sample for one minute then place a coverslip on the slide. See if can see the strands of DNA and any banding of genes.

Write-up

Convert these instructions to a step by step lab procedure that a student could easily follow to complete this lab.

As part of the procedure, at each step followed by a **[?]** explain the purpose and chemical basis of adding the different solutions and chemical to the mashed fruit. How does it aid in the extraction of the DNA from the mixture. You may need to use your class notes and online research to complete this.

Finally, write a summary of the results of your experiment.