DNA Extraction from strawberries

Required ingredients per extraction

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| 100g strawberries | Beaker |
| 10ml washing up liquid | Teaspoon (measures around 3g of salt) |
| 100ml water | Pipettes |
| 3g salt | Ice (to cool the alcohol) |
| Measuring beakers & cylinders | Alcohol (surgical spirits will suffice) |

Personal Protective Equipment **(recommended but optional, depending on availability and local H&S regulations)**

* Lab Coat
* Gloves
* Goggles

Protocol

Part 1:

1. Add everything to a Ziploc plastic bag and seal carefully
2. Squish the content of the bag thoroughly while ensuring there are no leaks
   1. *Removing air from the bag first will help to not break it*
   2. *Don’t squash too hard – mixing too roughly will break the bag and the detergent will become foamy*
   3. *Hold the bag from the top with one hand, and squeeze the mixture carefully with the other*
3. The salt and washing up liquid help to break open the cells and the nucleus, releasing the DNA inside
4. The DNA will be dissolved in the water so is invisible

Tips:

* Remove

Part 2 – **we recommend wearing PPE during this**

1. Strain the mixture through a coffee filter to remove solids
   1. *Be careful with the filter, if it breaks then you have to start filtering again. Folding down the spine it will help strengthen it.*
   2. While this is happening, emphasise the hazards of alcohol **(it is flammable, toxic, irritant)**
   3. Explain how participants will take turns with ice-cold alcohol – adding 1 pipette at a time (taking turns such that only 1 person is holding the alcohol at a time)
2. Place 5ml of the filtrate into a universal tube for each participant
3. Hold tube at an angle and carefully add ice-cold alcohol **[CAUTION – TOXIC]**
   1. *Squeeze empty pipette in the air, place carefully into the alcohol and slowly release pipette to allow liquid to go up. Then hold tube with filtrate at 45˚ and drip the alcohol down the inside of the tube – it is less dense than water so should float above it if added carefully.*
4. Add a total of 5ml of alcohol to form a layer ‘floating’ on top of the filtrate
5. The DNA is insoluble in alcohol so will come out of solution (condense) and become visible
   1. The DNA will look like a fluffy white blob and will be present at the interface between the two layers
6. Put the top on the tube and GENTLY swirl – you don’t want to mix together the layer of filtrate and alcohol
7. Clear up any spillage of alcohol thoroughly
8. Dispose of all tubes etc. – pupils are NOT allowed to keep them because of the alcohol
9. Suggest it can be tried at home – instructions are on internet – must have parental supervision

Troubleshooting

Q – Alcohol hasn’t formed a separate layer from the filtrate

A – Shaking the tubes will result in mixed layers / if the alcohol is added forcefully and directly onto the filtrate then it will mix

Q – Bag has broken when trying to break down the strawberries

A – Try and remove as much air as possible before doing this, also you don’t need to be rough when doing this. Often we get people to hold the bag from the top with one hand, and squeeze the strawberries with the other.

Q – The filtrate has bits in it

A – This will be a result of the coffee filter breaking. You can take this filtrate and put it through a fresh filter again to reuse it.