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OXFORD PUBLIC SCHOOL

DELHI

CHEMISTRY PROJECT FILE ON

QUALITATIVE ANALYSIS OF

COCONUT WATER

SUBMITTED BY :

DINESH GAUR

XII F (NON MEDICAL)

ROLL No. - 12

SUBMITTED TO :

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# Certificate...

This is to certify that Dinesh Gaur of class  
XII F (Non-Medical) has worked on the project.

## "QUALITATIVE ANALYSIS OF COCONUT WATER" ...

under my guidance. Her efforts are satisfactory  
and should be appreciated.

This report may be considered  
as fulfilment of "All India Secondary School  
Certificate Examination" conducted by Central  
Board of Secondary Education.  
NEW DELHI.

# Acknowledgement

I take this opportunity to express my gratitude and respect to all those who helped me in the completion of this project. I feel greatly thankful to God Almighty! for giving me the strength and making me capable of completing this project.

It is my great pleasure and honour to acknowledge my deep sense of gratitude to our Chemistry teacher for guidance, constant help and valuable support in making this project.

I am grateful to our principal for her keen interest, encouragement and all the facilities provided to me during the course of my project.

I also wish to thank our lab assistant for his prompt help in the completion of this project.

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I am also grateful to my parents and friends for their full support and co-operation.

Dinesh

Dinesh Gaur

81 F (Non-medical)

# Introduction....

The coconut (*Cocos nucifera* L) is an important fruit tree in the tropical regions and the fruit can be made into a variety of foods and beverages. The edible part of the coconut fruit (coconut meat and coconut water) is the endosperm tissue.

Endosperm tissue undergoes one of three main modes of development, which are the nuclear, cellular and helobial modes and the development of coconut endosperm belongs to the nuclear mode. Initially, the endosperm is a liquid containing free nuclei generated by a process in which the primary endosperm nucleus undergoes several cycles of division without cytoplasm of a single eukaryotic cell is divided to form two daughter cells. Cytokinesis then occurs, progressing from the periphery towards the centre, thus forming the cellular endosperm layer. At first, the cellular endosperm is translucent and jelly-like, but it later hardens at maturity to become

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white flesh (coconut meat). Unlike the endosperms of other plants (eg. wheat and corn), the cellularisation process in a coconut fruit does not fill up the entire embryo sac cavity, but instead leaves the cavity solution-filled. This solution is commonly known as coconut water and it is of cytoplasmic origin.

# Applications of Coconut Water.....

- Makes an excellent oral rehydration sports beverage - replaces electrolytes from exercise heat stress and illness.
- Aids in exercise performance.
- Natural isotonic beverage - contains the same level of electrolytes found in human blood.
- Has 15 times the amount of potassium as most sports and energy drinks (264 mg vs 12.5 mg/100 ml.)
- Reduces problems for infants suffering from intestinal disturbances.
- Cardioprotective: helps regular blood pressure (due to high potassium); improves circulation.
- Reduces swelling in hands and feet.
- Prevents abnormal blood clotting.
- Aids in kidney function including those with kidney stones, Nutritional support for those with urinary tract / bladder problems.

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- Helps balance blood sugar in diabetics.
- Improves digestion.
- Reported by some people to reverse cataracts.
- Contains nutrients that feed friendly gut bacteria.
- Helps relieve constipation or diarrhea.
- Possesses anti-aging properties.
- Nutritional support for healthy skin restores strength and elasticity to skin; reduces age spots; reduces wrinkles and sagging.
- Regulates the functioning of the intestine which promotes smoother, more hydrated which ps. skin.
- Enhances healing of wounds and lesions.
- Supports good vision and provides nutritional support in those who have a tendency towards glaucoma.
- Contains potent antioxidants.
- Nutritionally supports immune function.



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QUALITATIVE ANALYSIS  
OF

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# CHEMICALS REQUIRED

Barium chloride  
Sodium Bicarbonate  
Absolute Alcohol  
Sulphuric acid  
Ceric Ammonium Nitrate  
Glacial Acetic acid  
Benzene Sulphonyl chloride  
Sodium hydroxide  
Hydrochloric acid  
Potassium sulphate

# APPARATUS REQUIRED

Yeast tube stand  
Water Bath  
Bunsen Burner  
Tripod stand and wire gauze  
pH paper  
china dish

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# Test for Cation

S.No	EXPERIMENT	OBSERVATIONS	INFERENCE
1.	Coconut water + picric acid.	yellow colour	K present.
2.	Coconut water is introduced into flame using Pt wire	Brick red and golden flame.	Ca, Na present.
3.	Coconut water + NaOH sol <sup>n</sup> + H <sub>2</sub> S gas.	white ppt.	Zn present.
4.	Coconut water + Na <sub>2</sub> HPO <sub>4</sub> sol <sup>n</sup> + NH <sub>4</sub> in excess.	white ppt.	Mg present.
5.	Put a drop of coconut water on pH paper.	pH = 6	Acidic nature.

# Test for Anion....

S.No.	EXPERIMENT	OBSERVATIONS	INFERENCE
1.	Coconut water + pinch of Ammonium Molybdate + conc. $HNO_3$	yellow crystalline ppt.	$PO_4$ present.
2.	Coconut water + water + lead acetate.	white ppt insoluble in hot ammonium acetate.	$SO_4$ present.
3.	Coconut water + conc. $H_2SO_4$ .	No odour of vinegar.	$CH_3COO$ Absent.
4.	Coconut water + fresh $FeSO_4$ solution + conc. $H_2SO_4$ dropwise.	Brown ring observed.	$NO_3$ present
5.	Coconut water + $AgNO_3$ solution.	white ppt. soluble in excess ammonium hydroxide.	Cl absent

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# Test for Functional Group ....

S. No.	EXPERIMENT	OBSERVATIONS	INFERENCE
1.	Coconut water + Iodine.	No blue - black colour obtained.	starch absent.
2.	Coconut water + Conc. $HNO_3$	yellow ppt. not obtained.	Proteins are absent
3.	Pour a drop of coconut water on filter paper.	Paper becomes translucent.	Fats present

# Result....

A) The pure sample of coconut water contains respective ions

1. chloride
2. Nitrate
3. Phosphate
4. Dichromate
5. zinc
6. Magnesium
7. Potassium
8. calcium
9. sodium

B) The pure sample of coconut water is acidic in water.

C) The pure sample of coconut water is contains starch, oils and fats.

# Precautions...

1. Concentrated solutions should be handled with immense care.
2. Hands should be washed thoroughly after performing each experiment.
3. If chemicals come into contact with your skin or eyes, flush immediately with copious amounts of water.
4. Never leave burners unattended. Turn them off whenever you leave your workstation.
5. Never point a test tube or any vessel that you are heating at yourself or your neighbour.