SELECTED RESEARCH PAPERS OF NSF-2021 AS SAMPLES FOR REFERENCE

LIFE SCIENCE

13th ANNUAL SCIENCE FAIR VIRTUAL

VIRTUAL NATIONAL SCIENCE FAIR 2021

3,4 APRIL 2021

organized by

OMEIAT

ORGANIZATION OF MUSLIM EDUCATIONAL INSTITUTIONS AND ASSOCIATIONS OF TAMIL NADU

RATE OF GROWTH OF A PLANT IN DIFFERENT TYPES OF WATER

Life Science

Primary Level

RATE OF GROWTH OF A PLANT IN DIFFERENT TYPES OF WATER

Science Fair Project Report

Level		Primary
Category		Life Science

Submitted by
AFIYA .A
(Grade 4)

Imam Shafi (Rah) Mat. Hr. Sec. School
Adirampattinam.

Rate of growth of a plant in different types of water

CONTENTS

S . No	Title	Page number
1	Abstract	3
2	Introduction	4
3	Statement of the problem	6
4	Hypothesis	7
5	Design of study	8
6	Procedure	9
7	Collection of Data	10
8	Results	22
9	Discussion & Conclusion	23
10	Acknowledgement	24

ABSTRACT

My project is to find out the rate of growth of plants in different types of water. I selected five different types of water (pond water, tap water, purified water, sewage water and sea water). I observed daily and measured the growth of the plant.

INDRODUCTION

Are you wondering how does different types of water affect plant growth? The types of water used for every kind of plant have a significant effect on their growth.

Water is essential for everyone or anything; even the plants in the desert need it.

Different kinds of water could affect our bodies, and it is entirely the same as other plants.

In gardening, water is very important. Knowing the types of water would help you to pick what is best for your plants.

TRIAL 1


SCIENCE
FAIR PROJECT
2021
A. AFIYA.
GRADE 4
FILTER
WATER


SCIENCE
FAIR PROJECT
2021
A. AFIYA.
GRADE 4

STATEMENT OF THE PROBLEM

I am much interested in gardening . When I started growing plants my parents said only a few plants will grow in this soil. I was wondering then I thought what would happen if we grow the plants with various types of water. So I took the project.

HYPOTHESIS

Plants that are grown using tap water will grow fast.

DESIGNS OF STUDY

DEPENDENT VARIABLE :

- Fenugreek seeds

INDEPENDENT VARIABLE :

- Different types of water

CONTROLLED VARIABLE:

- Soil

MATERIALS :

- Bowl (5)
- Bottles
- Fenugreek seeds
- Thread
- Scale
- Pencil
- Survey form

PROCEDURE

- Label the five bottles of water and also the bowl

  (sewage, sea, pond, tap, purified water).
- I used 30 Fenugreek seeds for each bowl .
- Filled the same type of soil all the bowls.
- Sowed the seeds and watered it .
- Observed and data collected.
- We did the same procedure 3 times.
- Finally I came to a conclusion.

TRIAL 1

GERMINATION DETAILS

S.NO	TYPES OF WATER	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9
1	POND		✓			
2	TAP				✓	
3	PURIFIED	✓				
4	SEWAGE					✓
5	SEA	-	-	-	-	-

COLLECTION OF DATA

MEASUREMENT OF PLANT

S. NO	TYPES OF WATER	DAY 9	DAY 10	DAY 11	DAY 12	DAY 13	DAY 14	AVERAGE (cm)
1	POND	_	1.2	2.5	2.5	3	3.8	2.6
2	TAP	_	_	_	1.2	1.8	2	1.7
3	PURIFIED	1.2	1.8	1.9	2.5	3.8	4	2.5
4	SEWAGE	_	_	1.6	2.4	2.8	3	2.45
5	SEA	_	_	_	_	_	_	_

TRIAL 1

RESULT :

- The seeds germinated first in purified water after five days.
- The seeds germinated second in pond water after 6 days.
- Next in tap water after 8 days.
- The seeds germinated in sewage water after 9 days.
- There is no germination in sea water.

TRIAL 2

GERMINATION DETAILS

S. NO	TYPES OF WATER	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8
1	POND	✓				
2	TAP	✓				
3	PURIFIED	✓				
4	SEWAGE	_	_	_	_	_
5	SEA	_	_	_	_	_

COLLECTION OF DATA

MEASUREMENT OF PLANT

S.NO	TYPES OF WATER	DAY 9	DAY 10	DAY 11	DAY 12	DAY 13	DAY 14	AVERAGE
1	POND	1.2	2.5	2.8	3.9	5	5.3	3.5
2	TAP	1.8	2.7	3.1	5.8	7	7.8	4.7
3	PURIFIED WATER	1.9	2.8	2.9	3.1	3.4	3.9	3
4	SEWAGE	_	_	_	_	_	_	_
5	SEA WATER	_	_	_	_	_	_	_

TRIAL 2

TRIAL 2

- **RESULTS:**

Trial 2 was started from February 24 after three days the tap water, pond water and purified water plants are germinated on same days. But there is no germination in sewage and sea water.

TRIAL 3

GERMINATION DETAILS

S. NO	TYPES OF WATER	DAY 8	DAY 9	DAY 10	DAY 11	DAY 12
1	POND	✓				
2	TAP	✓				
3	PURIFIED	✓				
4	SEWAGE	_	_	_	_	_
5	SEA	_	_	_	_	_

COLLECTION OF DATA

MEASUREMENT OF PLANT

S. NO	TYPES OF WATER	DAY 9	DAY 10	DAY 11	DAY 12	DAY 13	DAY 14	AVERAGE
1	POND	3.6	3.8	4	4.5	4.9	5.5	4.4
2	TAP	3.6	5.2	5.8	6.2	7.5	8.6	6.2
3	PURIFIED	3.2	4.5	4.8	5	5.2	5.8	4.8
4	SEWAGE	_	_	_	_	_	_	_
5	SEA	_	_	_	_	_	_	_

TRIAL 3

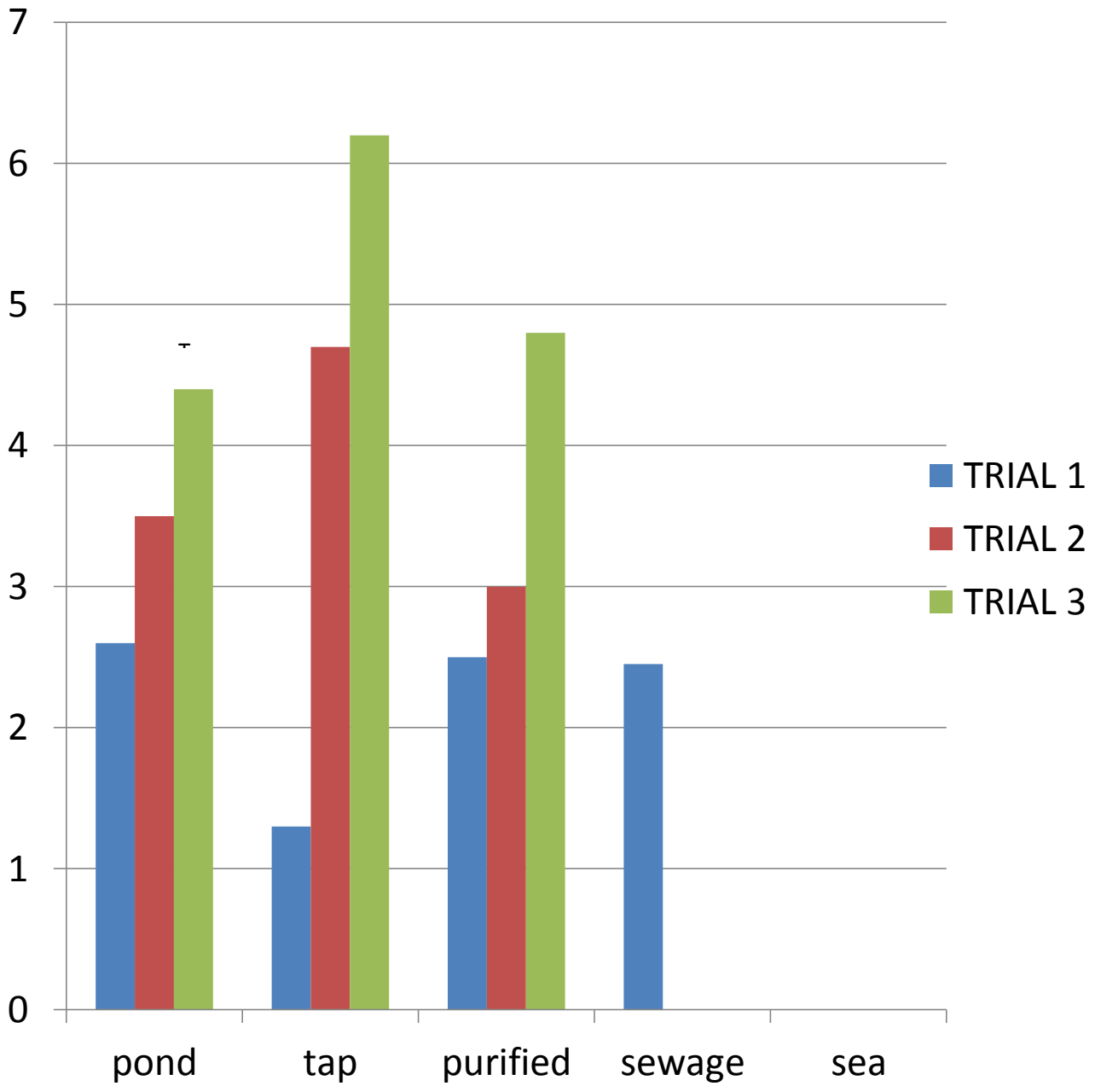
- **RESULTS**

Trial 3 was started from March 5 after two days the tap water, pond and purified water plants are germinated. But there is no germination in sewage and sea water.

TRIAL 3


DAY 1
SCIENCE FAIR
DAY 2
SCIENCE FAIR
DAY 3
SCIENCE FAIR
DAY 4
SCIENCE FAIR
DAY 6
SCIENCE FAIR
DAY 7
SCIENCE FAIR
TAP

GRAPHICAL REPRESENTATION



RESULTS

The original purpose of this experiment was to determine, whether plants grow better in **Tap water**.

DISCUSSION & CONCLUSION

- The seeds were not germinated when we used sewage water because it contains more pollutants.
- Since the sea water contains more salt the seeds were not germinated in that bowl also.
- The plants growth in tap water is better than pond and purified water.
- As we decided earlier we got quick and fast growth in tap water.

ACKNOWLEDGEMENT

First of all I am grateful to the ALMIGHTY for establishing me to complete this project.

I am grateful to our guide teachers

Mrs. G.Zeenath Begum, Mrs. A.Shajahan,

Mrs. V. Vidya who have taught guided and supported .

I wish to express my sincere thanks to our school management, **correspondent**

Haji. M.S.Mohamed Azam, Principal
Mrs.A.Meenakumari, Instructional coach
Mrs.Gulzar.

" Thank you is the least I can say to you to show my appreciation for everything you have done for me".

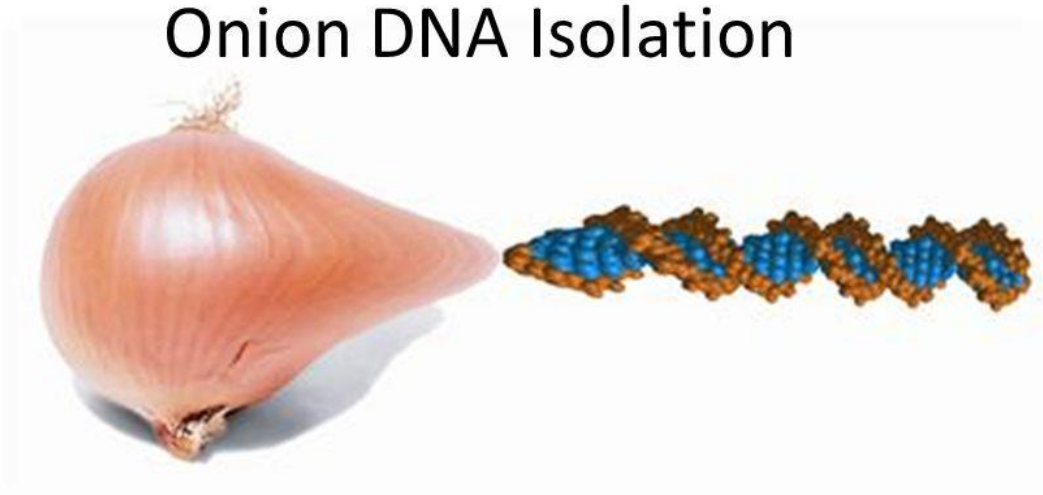
I would like to thank my parents who have helped me with their valuable suggestions and guidance has been very helpful in various phases of the completion of the project.

HOW DNA ISOLATION CAN BE FORMED BY ONION?

Life Science

Primary Level

HOW DNA ISOLATION CAN BE FORMED BY ONION ?



DNA Thought for the day:

"The capacity to blunder slightly is the real marvel of DNA. Without this special attribute, we would still be anaerobic bacteria and there would be no music." ~Lewis Thomas

How DNA isolation can be formed by onion ?

Science Fair Project Report

Level.	*Primary*
Category	*Life Science*

SUBMITTED BY: MEHREEN ABBASI

CREATIVE ENGLISH SCHOOL

C.E.S.
CREATIVE ENGLISH SCHOOL
GOVT. RECOGNISED REG. NO. 81/24/2017

How DNA isolation can be formed by onion?

CONTENT

Chapter No.	Title	Page No
1	Abstract	
2	Introduction	
3	Statement of the Problem	
4	Hypothesis	
5	Design of Study	
6	Collection of Data	
7	Results	
8	Discussions	
9	Application	
10	Conclusion	
11	Acknowledgement	
12	Reference	

ABSTRACT

DNA molecules are large strength or change of small molecules known as nucleic acids, which are localised in the nucleus of a cell. This kit allows to break open plant cells and their nuclei to release the genomic DNA using a mechanical disruption and a protease to digest away the cell and nuclear walls. Once released, the genomic DNA is visualised by the addition of a precipitating solution alcohol and high salt, which causes the DNA to precipitate and become visible.

INTRODUCTION

Deoxyribonucleic acid (DNA) is a nucleic acid polymer, consisting of the monomers called nucleotides . Each nucleotide consists of a phosphate group, a deoxyribose pentose sugar and a nitrogen base from either, adenine, thymine, guanine and cytosine. DNA, which is found in the nucleus of cells contains a set of coded instructions made up of a specific order of nucleotides, particularly the nitrogen bases . DNA molecule is made up of two nucleotide chains that are by hydrogen bonds between the complementary base pairs and arranged in a spiral shaped, known as double helix structure.

There are various methods for DNA extractions, each having its advantages and disadvantages. One method is the enzymatic extraction method. It involves the usage of the enzyme, protease which digests the protein content of the sample that is heated to suitable enzymatic action temperature. Ice-cold ethanol is then used to precipitate and store the broken down. The DNA will be left between the mixture and the ethanol . The advantage of this method is that it is fast and produces high yield of DNA. The disadvantage of this method however, is that protease is an enzyme, short in shelf life time, needs to be preserved and can only be effective at specific temperature.

Another method is the phenol-chloroform extraction method. It uses chloroform, phenol to remove protein and isoamyl alcohol to separate the DNA content . The advantage of this method is that the yield of DNA is very high while the disadvantage is that a great quantity of sample is required for the extraction. The next method is the CsCl density gradient extraction method. By centrifugation, the DNA is separated by its density, which appears when its density is the same with the CsCl gradient. The advantage of such method is that the purity of the DNA content is high but the it is very time-consuming. The experiment is very important to be conducted because it helps us to study and understand more of life and

its connection to various species here on earth at the level of genetics. By successfully extracting DNA, we can preserve and duplicate the genetic codes of life. We can lengthen our medical research to detect the faulty codes responsible for many genetic diseases. Through genetic engineering with the knowledge of DNA extraction, we could bring an end to such diseases that have affected mankind. Hence, further research and development on DNA extraction will greatly benefit us.

STATEMENT OF THE PROBLEM

The isolation of DNA can be done from the given sample, sample maybe cabbage, tomato, potato, cauliflower, papaya, and many more.

The question is, " In the process of DNA isolation will crushing allows the breakage of cells to extract the DNA from the inner cells, Why heat is needed to enhance the outcome of DNA from the sample?"

HYPOTHESIS

- *If I could mix DNA with NaCl salt, ethanol/sanitizer and liquid soap ,Then I could extract and see it clearly.*
- *And from this point I decided to conduct an experiment to extract the DNA from plant tissue. I use 'Onion' for my experiment as it cost abundance and low starch content.*

DESIGN OF STUDY

★INDEPENDENT VARIABLE:

- Types of Fruits and Vegetables

★DEPENDENT VARIABLE:

- Structure of Onion DNA

★CONTROLLED VARIABLE:

- Method of Extraction

MATERIALS

- Ethanol/Sanitizer
- Water (40-50 ml)
- Onion (2-3).
- Liquid soap (2-3 tbsp)
- Strainer
- Beaker -2
- Spoon/Spatula
- Tripod stand
- Matchbox
- Petri dish
- Knife
- Glass Rod
- Wire guage
- Grinder
- Salt (4-5 tbsp)
- Candles/Spirit Lamp

PROCEDURE

- Take 2 onions, chopped it and transfer it into the grinder then take out grinded onion with the help of plastic spoon or spatula, slowly transfer the grinded onion into the 250 ml of beaker-1.
- Take another beaker-2 ,Pour 2 to 3 tbsp of liquid soap and detergent into it.Add 4-5 tablespoon of salt (NaCl). Both salt and liquid soap plays an important role for the isolation of DNA .
- After adding both salt and liquid soap, solulize this mixture with 40 to 50 ml of water. Here, amount of water is taken according to the quantity of onions. For making the mixture soluble, use glass rod.

- When the mixture becomes soluble, Pour beaker-2 in beaker-1 ,i.e; containing grinded onions . Occasionally stirs the mixture, with the help of glass rod. Because salt and liquid soap can be mixed in it properly.
- Filter the mixture with the help of strainer and leftover is our filtrate.
- Heat the filtrate mixture for 1-2 minutes by continuous stirring.
- Take chilled ethanol or sanitizer in petridish/glass and add this filtrate gently.
- Long strands of DNA should appear.Observe the DNA.

RESULTS:

- The DNA extraction process was performed in the school. The detailed procedures had to be performed in order to produce DNA strands. Figure 3.0 represents the degrading mixture that had been mixed with the onion pieces before heating and filtration. Figure 3.1 shows the filtered solution obtained from the heating of the mixture before the ethanol was added which is in the waterbath for cooling down the DNA mixture . Figure 3.2 represents the final results obtained after the ethanol was poured into the filtered solution, where the layers of precipitation containing the mixture precipitate, DNA strands can be clearly seen in the petri dish after it has settled for 5 minutes.

Figure 3.0: The onion pieces mixed with the degrading mixture before being heated .

Figure 3.0 represents the mixture formed after the onion that was chopped into small pieces to increase surface area was added into the degrading solution.

Figure 3.1: The purified sample after being heated and filtered and put in the water bath to cool down the mixture .

Figure 3.1 represents the purified sample containing DNA , after being heated and filtered through a strainer.

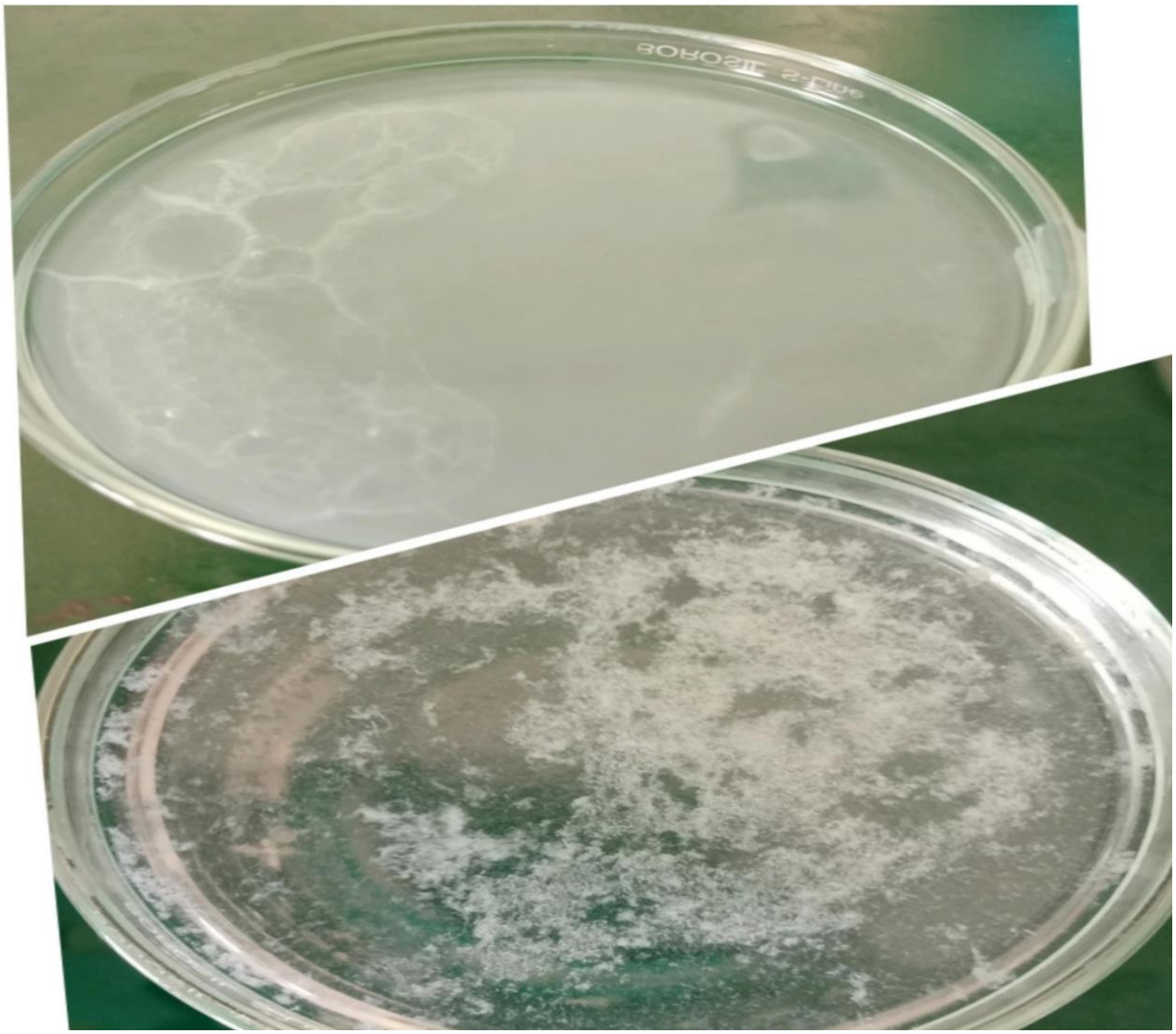
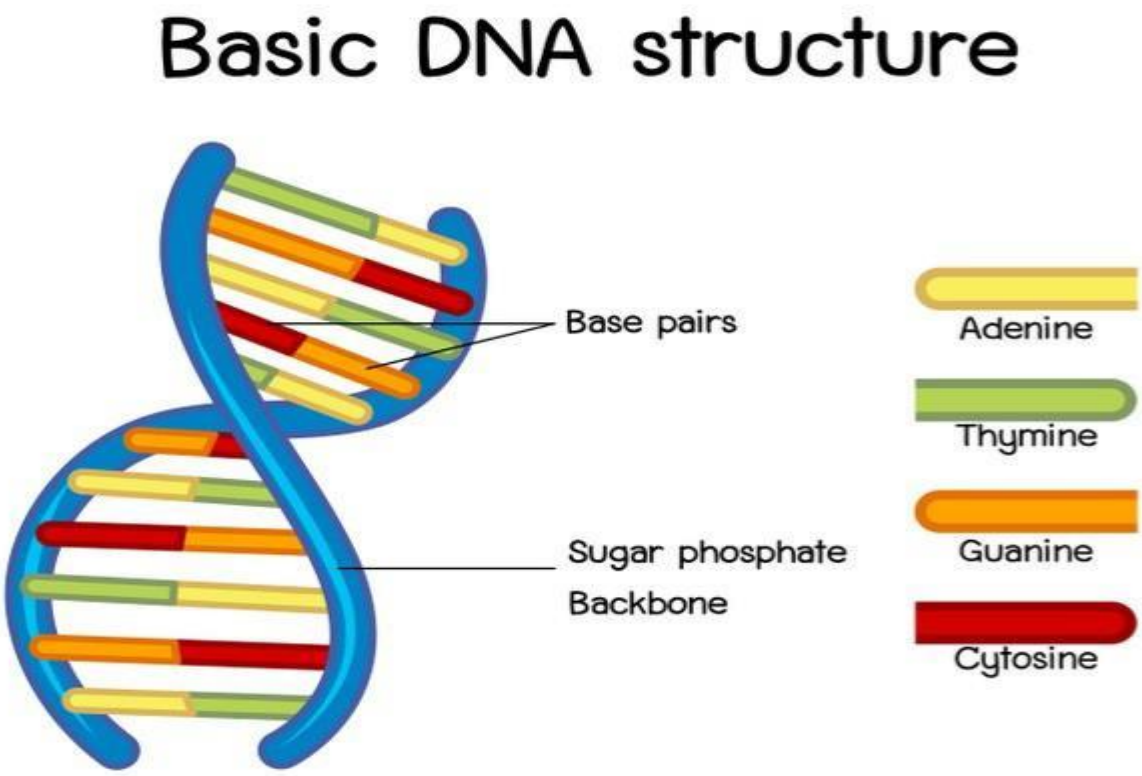


Figure 3.2: Precipitation layers of ethanol, DNA extract and precipitate formed after ethanol was added to the filtered sample.

Figure 3.2 represents the result of adding ethanol to the extracted mixture and left for 5 minute period of time. The result is the white precipitate formed, Hence it is our required DNA

4.0 DISCUSSIONS:

- **Double helix** is the description of the **structure** of a **DNA** molecule. A **DNA** molecule consists of two strands that wind around each other like a twisted ladder. Each strand has a backbone made of alternating groups of sugar (deoxyribose) and phosphate groups.



•DNA is made up of molecules called nucleotides. Each nucleotide contains a phosphate group, a sugar group and a **nitrogen base**.
The four types of **nitrogen bases** are adenine (A), thymine (T), guanine (G) and cytosine (C).

•An **onion is used** because it has a low starch content, which allows the **DNA** to be seen

clearly. The salt shields the negative phosphate ends of **DNA**, which allows the ends to come closer so the **DNA** can precipitate out of a cold alcohol solution

The purpose of each ingredient in the procedure is as follows: Liquid soap helps to dissolve the cell membrane, which is a lipid bilayer.

Sodium chloride helps to remove proteins that are bound to the **DNA**. It also helps to keep the proteins dissolved in the aqueous layer so they don't precipitate in the **alcohol** along with the **DNA**. Ethanol causes the **DNA** to precipitate. When **DNA** comes out of solution it tends to clump together, which makes it visible **Heating** helps to denature proteins, extract **DNA** from spots, increase speed of chemical reactions, inactivate enzymatical reactions inhibitors etc.

The ability to extract DNA is of primary importance to studying the genetic causes of disease and for the development of diagnostics and drugs. It is also essential for carrying out forensic science, sequencing genomes,

detecting bacteria and viruses in the environment and for determining paternity.

5.0 CONCLUSION:

This experiment was carried out to extract the DNA from an onion. After each step of the extraction process was carried out in order, a mixture of 3 layers was produced. The topmost layer being ethanol, followed by the DNA of the onion in the middle and the bottom-most layer being the mixture of cell debris. Improvements can be made to the method to allow higher quality yield to be made, and alternative methods could also be used to extract DNA for different uses.

6.0 REFERENCES

Armand-Frappier Museum. (2008). Micro-Discoveries Online Extracting DNA from onions.

Retrieved from http://www.musee-afrappier.qc.ca/en/index.php?pageid=3560 &page=3560-edu-dna-onion-e

Britannica. (2018, December 10). *DNA*. Retrieved from

https://www.britannica.com/science/DNA

Chemistry LibreText. (2018). 9.2: Relative Permittivity. Retrieved from

https://chem.libretexts.org/Bookshelves/Inorganic_Chemistry/Map%3A_Inorganic_

Chemistry_(Housecroft)/09%3A_Non-aqueous_media/9.02%3A_Relative_Permittivity

Dotson, J. (2018). Restriction enzymes. Retrieved from https://www.sciencelearn.org.nz/resources/2035-restriction-enzymes

Eickbush, T., & Moudrianakis, E. (1978). The compaction of DNA helices into either continuous supercoils or folded-fiber rods and toroids. *Cell*, *13*(2), 295-306. doi:

10.1016/0092-8674(78)90198-8

Genetic Education. (2018). Different Types of DNA Extraction Methods. *Genetic Education*. Retrieved from http://geneticeducation.co.in/different-types of-dna-extraction-methods/

Guo, M., Hu, X., Wang, C., & Ai, L. (2017). Polysaccharides: Structure and Solubility. *Solubility Of Polysaccharides*. doi: 10.5772/intechopen.71570

Izutsu, K. (2011). *Electrochemistry in nonaqueous solutions*. Weinheim: Wiley-VCH Verlag

GmbH & Co.

Khan Academy. (n.d.a). *DNA structure and function*. Retrieved

from https://www.khanacademy.org/test-

prep/mcat/biomolecules/dna/a/dna-structure-and-func tion

Khan Academy. (n.d.b). *Structure of the plasma membrane*.

Retrieved from https://www.khanacademy.org/science/high-

school-biology/hs-cells/hs-the-cell-membran e/a/structure-

of-the-plasma-membrane

Kimball's Biology Pages. (2014). Restriction Enzymes. Retrieved from http://www.biology-pages.info/R/RestrictionEnzymes.html

Life Sciences Cyberbridge. Retrieved from http://cyberbridge.mcb.harvard.edu/dna_1.html

Maniatis, T., Fritsch, E.F., Sambrook, J. (1982). *Molecular cloning*. *A Laboratory Manual.* Cold

HOW DOES SMELL AFFECT TASTE?

Life Science

Primary Level

TITLE OF THE PROJECT

HOW DOES SMELL AFFECT TASTE?

TABLE OF CONTENTS

S. NO	CONTENTS	PAGE NO
1	ABSTRACT	3
2	INTRODUCTION	4
3	METHOD	5
4	RESULT	8
5	DISCUSSION	11
6	CONCLUSION	12
7	REFERENCES	13
8	ACKNOWLEDGEMENT	14

ABSTRACT

I wanted to investigate if a person could identify a food without the sense of smell or sight. Did your nose really know? To do this, I needed 4 volunteers to taste 6 different fruits. 4 volunteers are adults. Following fruits would be used for the experiment - lime, apple, banana, papaya, water melon, tomato and peppermint oil extract. I predicted that smell does affect the way the food which tastes indifferently.

INTRODUCTION

When you smell something through your nostrils, the brain registers these sensations as coming from the nose, while smells perceived through the back of the throat activate parts of the brain associated with signals from the mouth.

Our sense of smell in responsible for about 80% of what we taste. Without our sense of smell, our sense of taste is limited to only five distinct sensations: sweet, salty, sour bitter and the newly discovered “umami” or savory sensation. All other flavors that we experience come from smell. This is why, when our nose is blocked, as by a cold, most foods seem bland or tasteless. Also, our sense of smell becomes stronger when we are hungry.

We know that some things affect taste, and having a cold is the most familiar example. We do not taste food as well when our heads are stuffy and our noses are clogged. Does that mean smell contributes as much or more to taste as the taste buds?

Researchers have found that when volunteers wore nose plugs, their sense of taste was less accurate and less intense than when they tasted the food without the nose plugs. Smell did appear to make a difference. However, nose plugs did not completely block all ability to taste. Because the nose and throat essentially share the same airway, chewing some foods allows aromas to get the nose through the back of the mouth even when the nostrils are closed.

METHOD

Materials required:

- 6 volunteers, none of them are allergic to any of the food have given them.
- Assortment of fruit
- Knife
- Cutting board
- 3 large plates
- Q-tips
- Essential oil of peppermint
- Clipboard
- Pencil
- Water
- Cups

Independent Variable:

The independent variables are the things are used for smelling and tasting.

Dependent Variable:

The subject's report of what the taste was similar.

Procedure

- While I started my experiment, made sure that each of my volunteers aware that they were participating in an experiment related to smell and taste. I have enquired them if they have any allergies to fruit or peppermint oil.

- Created a data table I filled it quickly as I was testing each volunteer and made a copy for each volunteer.3. Chopped the fruit into bit-sized pieces. I needed four pieces of each kind of fruit for each volunteer.

- Stuck a toothpick in each piece of fruit.

- I made sure all different types of fruit were cut into pieces of the same size and that there were no pieces of fruit skin or seeds and I made piles of each type of fruit on each of the three plates.

- For one plate of fruit, used the cotton swab to dab a drop of pepper-mint oil on each piece of fruit.

- I didn't allow the volunteers see the plates of fruit. Also, I informed them to close their eyes or be blindfolded throughout the experiment.

- I have examined each volunteer separately.

- Started with the fruit with peppermint oil on top. I have given 15 seconds to identify the fruit. If they

identified the fruit correctly, I put a check mark on the data table with their name. If they had not identified the fruit I marked “0” on the chart.

- After testing everybody with peppermint oil covered fruit, gave each volunteer some time to rest, and informed to drink a glass of water, and eat a couple crackers.

- Repeated the experiment, asked them to close their eyes and hold their noses as they tasted each fruit.

- Again, it repeated several time to do the final trial.

- For the next trial, volunteers just closed their eyes.

- Repeated the taste test and I had recorded the results in each data table.

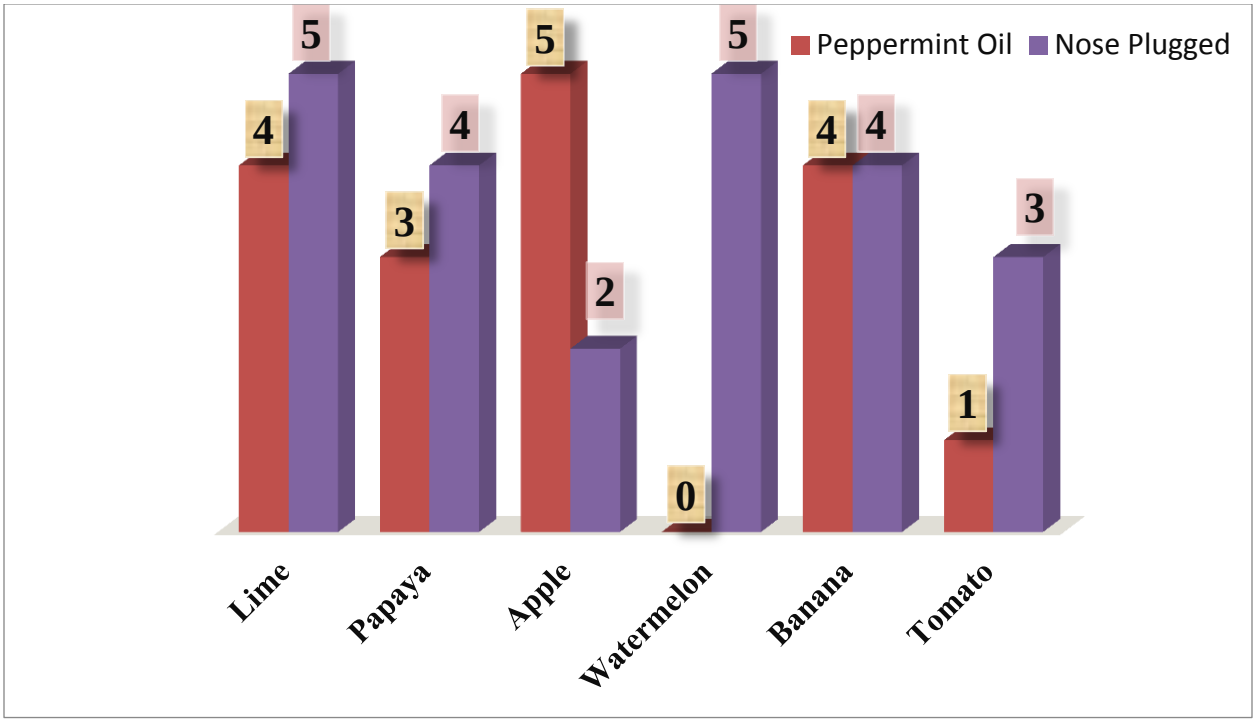
RESULT

Results would vary depending on the fruits I chose, the peppermint oil and volunteers. In general, volunteers would be less able to recognize the taste of the fruit when it was masked by peppermint oil and when holding their noses.

DATA TABLE

Fruit	Peppermint Oil	Nose plugged
Lime	4	5
Papaya	3	4
Apple	5	2
Watermelon	0	5
Banana	4	4
Tomato	1	3

DATA CHART



• There was no significant relationship between the two variables. It is not very likely for smell to have an effect on taste.

• The group that was able to smell the food they were tasting: 5/6 participants got their guesses correct.

• The group that was not be able to smell anything while they were eating: 1/6 got their guesses correct.

• The group that was smelling a different food as they were eating: 3/6 participants got their guesses correct.

DISCUSSION

What differences between closing the nose while tasting and not closing the nose. Explained the results in the tables and graphs in terms of whether closing the nose (blocking the sensation of smell) had an effect on taste. What does the test say about the statistical significance of this difference in the perception of taste? Is the taste really affected or is it flavor?

Explore which sense is more dominant - taste or smell? For some foods, smell might overwhelm our recognition of taste. Blindfold a volunteer and ask them to try a slice of apple. I have informed them to smell the flavor of the food while they were eating it. Put a slice of fresh onion under their noses when they start to taste the apple. Do they taste apple or onion? Discuss what this result says about our sense of smell. Likewise, I have explained some plausible factors that could have influenced the results.

CONCLUSION

In conclusion, I discovered that people do need their nose to taste and when the volunteers could smell they guessed more than half of the ingredients correct. On the other hand, with their noses' plugged little to no foods were guessed correctly. My hypothesis was correct because people didn't recognize the food without smell. The volunteers could recognize if the food was sweet, salty, or bitter without smell but couldn't narrow it down to a single food. As soon as the volunteers took off their nose plug, they could tell what they tasted. The things I could change to make my project better would be to fine foods with identical textures. My project helped me to learn that the sense of smell is a major factor on how things taste. Overall, my project was a success.

REFERENCES

- The Physiology of Taste by Jean-Anthelme Brillat-Savarin.
- Exploring the sense of taste by Emma Carlson
- http://www.sciencekids.co.nz/experiments/smelltaste.html
- http://www.brainfacts.org/sensing-thinking-behaving/senses-and-perception/articles/2012/taste-and-smell/
- http://www.innerbody.com/image/nerv12.html

ACKNOWLEDGEMENT

After an intensive period, today is the day: writing this note of thanks is the finishing touch on my Research. It has been a period of intense learning for me, not only in the education arena, but also on a personal level. Writing this research has had a big impact on me. I would like to reflect on the people who have supported and helped me so much throughout this period.

I deeply wish to express my sincere thanks to Dr. A. Nigar Akthar, Principal of FATHIMA CENTRAL SENIOR SECONDARY SCHOOL, our Vice Principal Naaz Parwar, Nayeem Akthar and Academic coordinator Salma Sulaiman. I wish to extend my heartfelt and sincere thanks to NSF Team 2020 -2021. I wish to express my thankfulness to all teaching staff members' non-teaching staff members of the school for their cooperation and unhindered support in the progress of my study on the research.

SOIL PROFILING USING COCOPEAT

Life Science

Junior Level

OMEIAT NATIONAL SCIENCE FAIR PROJECT

RESEARCH PLAN

Project registration id- NSF21-JLS-A-022

Project Title- Soil Profiling using Cocopeat

Name- Z.Farhaan Hussain

School- FATHIMA CENTRAL SENIOR SECONDARY SCHOOL

City and State- Chennai,Tamil Nadu

Level	Junior
Category	Life science

Soil profiling Using CoCo-Peat

Sr.No	Contents	Pg.no
1	Abstract	3
2	Introduction	3
3	Hypothesis	4
4	Design of study	5-6
5	Origin of research and procedure	7-12
6	Collection of data • Photos • Graphical represent • Tabular form	13-17
7	Result	18
8	Discussion	19-20
9	Conclusion	21-23
10	Future enhancement	24
11	Application	25-26
12	Acknowledgement	27
13	Refrences	28

Abstract

Coco peat can be directly incorporated into the garden soil to improve water retention, aeration and decrease the risk of the soil fungus and root diseases. Mix in soil at 25/75 ratio. It can also be used as a mulch around garden plants to help the soil retain moisture and prevent weed growth.

Coco peat increases the porosity of the potting mix. This helps to keep the soil loose and airy helping in better root growth. Better root growth results in better plant growth and higher yield. **Coco peat** increases the water

holding capacity of the potting mix even as it increases the porosity of the soil.

Hypothesis

If the plant is in rough areas coco peat should be added for regular growth

.

- Because coco peat has vulnerable quantity

And absorbs more water then normal soil.

Design of study

Independent Variable

- The amount of sunlight
- The amount of water

Dependent Variable

- The reign of the plant i.e,
  For 15 days I can take a sample
  Without coco peat and measure the length of the root and Vice versa with the pot in

which coco peat has been added.

Controlled Variable

- Amount of Cocopeat(coconut husk) Added into the pot of the plant.
- The place its kept.

Origin Of My Research

I Came across Coco-peat while my grandmother was doing terrace farming which is like a small garden

And for the betterment of those plants she added coco-peat

I started my research on coco-peat
Whether it was used in big farms as its merits are very usefull
And it can store a lot of water
This is where I thought_____

Why isn't Coco-peat Used in big farms?

METHODOLOGY AND PROCEDURE OF MY RESEARCH

a way of doing something based on particular principles and methods.

Firstly after registering for my omeait science project

I started with my research on cocopeat

During the course of the research I found out it is a rich resource

And is quite under-rated in the farming industry

It not only does give the soil more capacity of water and makes it healthy.

It also stops the formation of Seaweed

Seaweed it self has its own life so it also needs nutrients, in order to attain them, Seaweed tries to snatch nutrients from the opposite plants

Which also interrupts the particular well being of the plant.

Coco peat can Be a well wisher and an aid for the farmers.

They say "Coco is your half-way House"

This was a Short well defined Recap on my research work.

Now is the procedure-

Firstly, I thought all this praise on Coco-peat (coconut husk)

Is it all true?

With this doubt within me, I took Part in omeait.

Now to make it a Well defined Research

I had to put effort

I firstly brought all the needy materials

Like coco peat , adequate soil And Pots etc.

I then put a few seeds of Herbal Citric fruit

In normal soil of 600grams

And Another citric fruit seeds into another pot of 600g

I had an idea of keeping two in each sample so that I could get an average

Which could be beneficial in proving out results

Then I took same seeds and put them in a pot with

500 grams of soil and 75 grams of coco peat

And another sample with the same ratio amount

500g:75g

Now all I Had to do was give it adequate sunlight

And water

And have patience within me

A few days later I got selected for the preliminary round of omeait

Which gave me more hope to do better

Now

I started noting down and noticing each of its minor changes which occur in it

Actually I didn't find any changes or anything in the start of its growth

But as Days passed By

I noticed changes

These changes were proving out the characteristics of Coco-peat

While it was growing I wasn't watering it for two to three days

Then when I saw my plants

I noticed the pots A(with no Coco-peat)

Was seeming drained and a bit bent

Where as pots B(With Coco-peat)

Was the same as I saw it two to three days before

These are minor milestones though

They prove the characteristics of the rich resource

This also gave me a hypothesis-

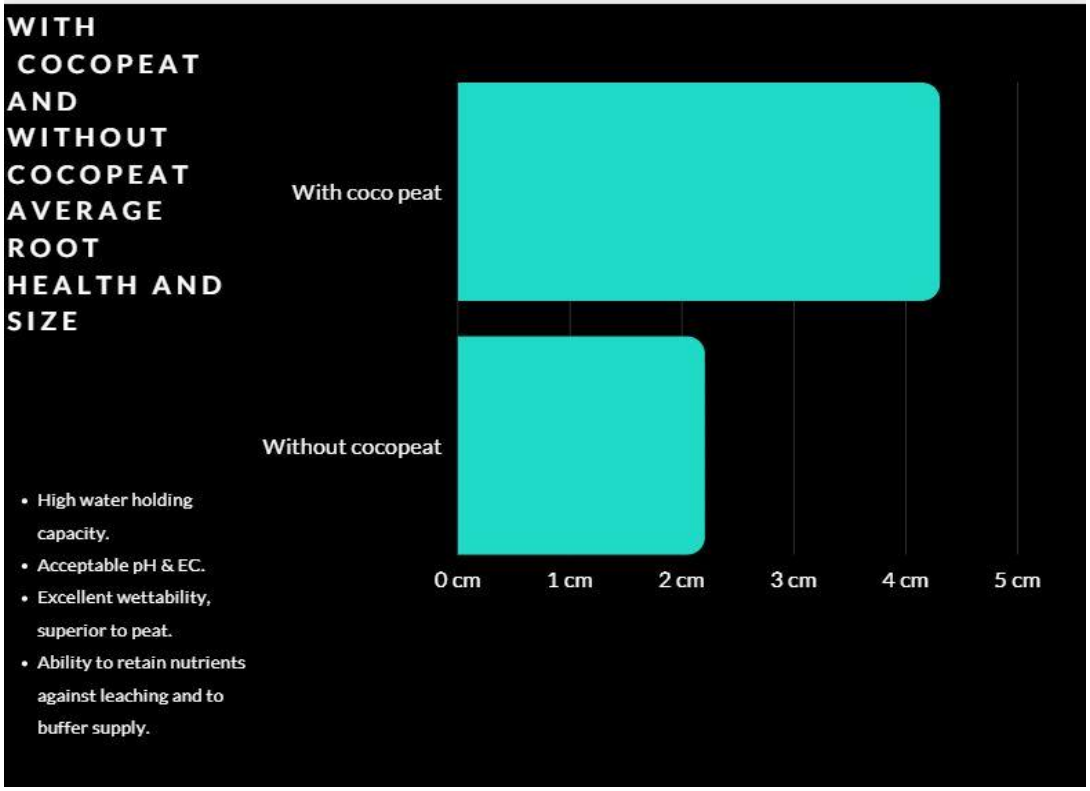
Coco-peat with soil improves its health.

Because I myself noticed it retains nutrients for the better us

COLLECTION OF DATA-

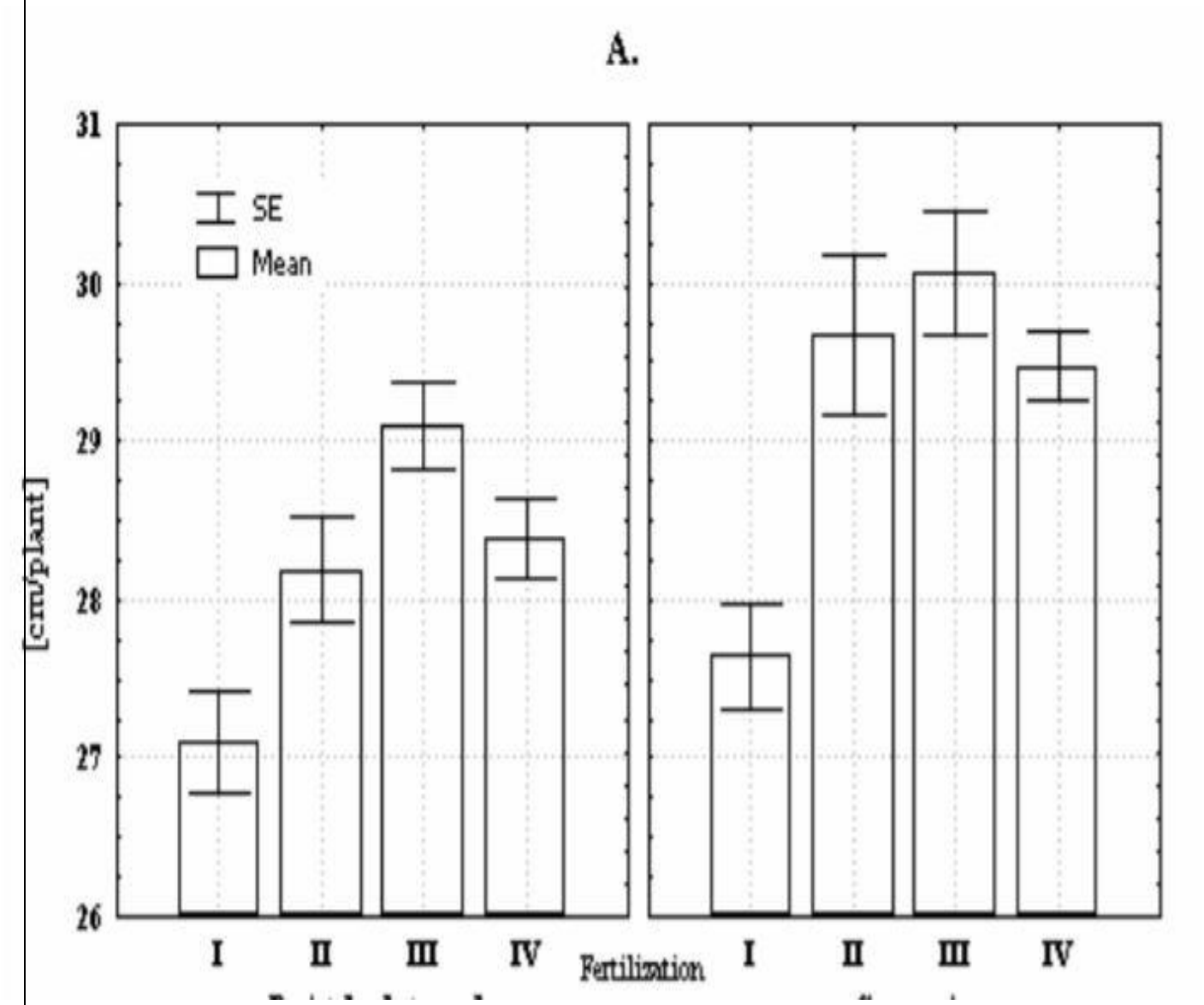
Pot A with out cocopeat

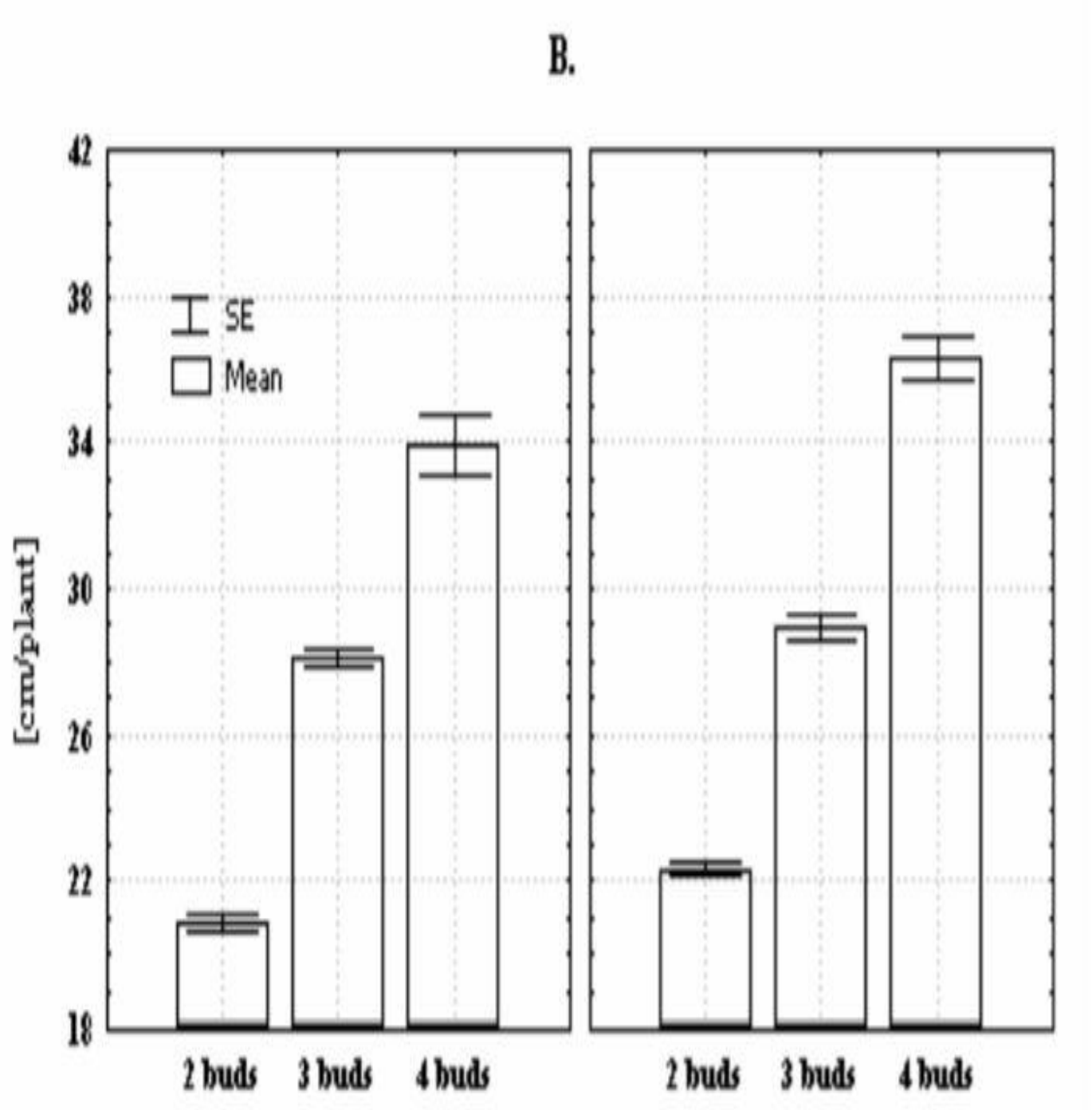
Pot B with cocopeat



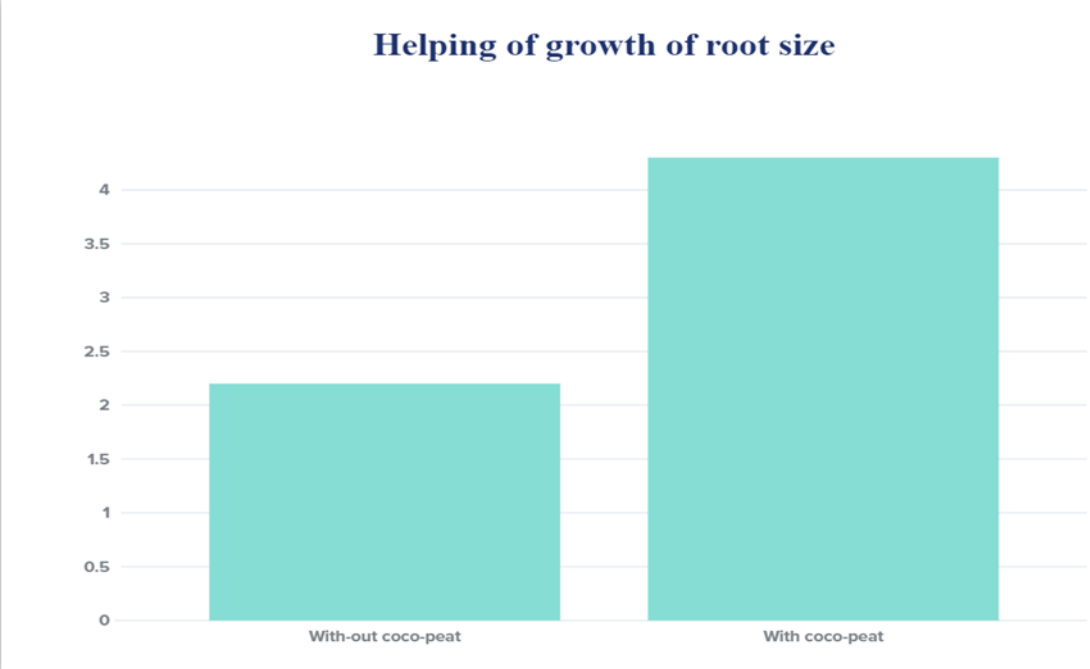
Average root health shown on graph

- Growth of Buds
- And help of cocopeat in plants fertilization


A.
SE
Mean
[cm/plant]
31
30
29
28
27
26
I
II
III
IV
Fertilization
I
II
III
IV


B.
42
38
34
30
26
22
18
[cm/plant]
SE
Mean
2 buds
3 buds
4 buds
2 buds
3 buds
4 buds

Variable	Test-1	Test-2	avg
w-coco	4.1cm	4.5cm	4.3cm
w/o-coco 2.3cm	2.5cm	2.2cm	



What do these results mean?

Plants grown in **cocopeat** had better developed root system. The number of bulb roots and total root length were 34% and 118% higher in **cocopeat** than in control medium, respectively

The results that I have achieved,are satisfying the characteristics of Coco-peat

According to S.K. Gowthaman, CEO of Bio Garddener, a Coimbatore-based firm specialising in coco peat products-
75 coconut trees could be grown on a one-acre farm. Each tree yields 150 to 180 fruits in a year.

So far there no commonly held beliefs or Myths yet on coco-peat

DISCUSSION

THE POSSIBLE ERROR IN MY RESEARCH- WAS WHILE THE PROCESS OF GROWING I SHOULD HAVE ADDED MORE AMOUNT OF COCO PEAT SO THAT I COULD OBSERVE WHAT HAPPENS WHEN THERE IS MORE COCO-PEAT THEN SOIL.

IT COULD'VE FOUND ME MORE RESULTS

A famous website called gardeningknowhow.com

Stated

Coco peat should be used for sustainability in the plant and soil

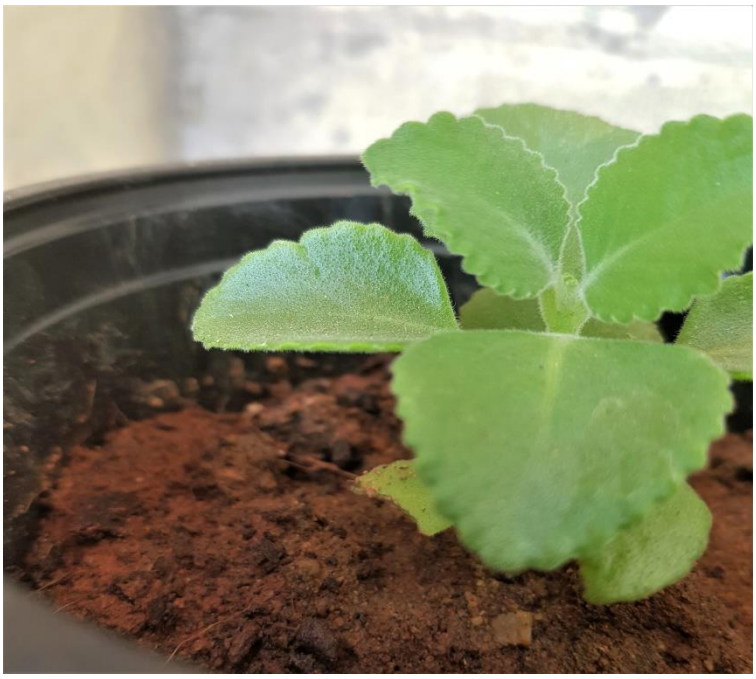
For the ease of use

Lower cost

All the stated things are true enough and have been proved in the research

There was this question I had within me

In the start of the growth they resembled each other, stating no difference but after days passed the question got its answer.



Conclusion-

The results showed that cocopeat, used as a growing medium, had beneficial effect on plant growth, flowering and root development. ... The early flowering of plant pots in cocopeat could be the results of faster plant development due to good root system and better heat properties of cocopeat.

I've had various research questions

Few of them are

- Is all the praise on CoCo-Peat all true?

After all my work I can say the praise on it is actually true

- What does it do?

It actually does a lot just more then developing root health and should be Necessary in every farm hold.

Few people who have Used coco products in their farms and farming methods have turned a fortune.

All my research tries to say is that coco peat is very beneficial not only for indoor but outdoor as well.

My hypothesis was coco peat in rough areas situated plants is Necessary

My research supports the hypothesis.

Future of my research

An interesting future study might involve testing coconut's products which are useful.

Such as-

- Cut Coir Fibres

- Dark Cocopeat

- Raw Cocopeat

- Washed Cocopeat

- Buffered Cocopeat

- Cocohusk Husk Chips

- Crushed Cocohusk

Applications of Coco-peat over Other Mixers

- ***High water holding capacity***
- ***Acceptable pH & EC***
- ***Excellent wettability, superior to peat***
- ***Ability to retain nutrients against leaching and to buffer supply***
- ***Unique water holding capacity***
- ***Good drainage / aeration***
- ***Less shrinkage***
- ***Retains physical properties longer***
- ***Light weight***
  - ***Promotes strong root growth and plant vigor.***

Absorbs water readily and re-wets easily, thus reducing the need for wetting agents.

- ***Reduces watering frequency without plant stress, thereby reducing labor costs and minimizing plant loss***
- ***Increases shelf life of plants***

- ***Slow breakdown of material means product will not shrink during your growing cycle***

Acknowledgement-

I would like to express my Special gratitude to my guide teacher and “Mrs.Annie ruth heleena” For her guidance and support in completing my project.

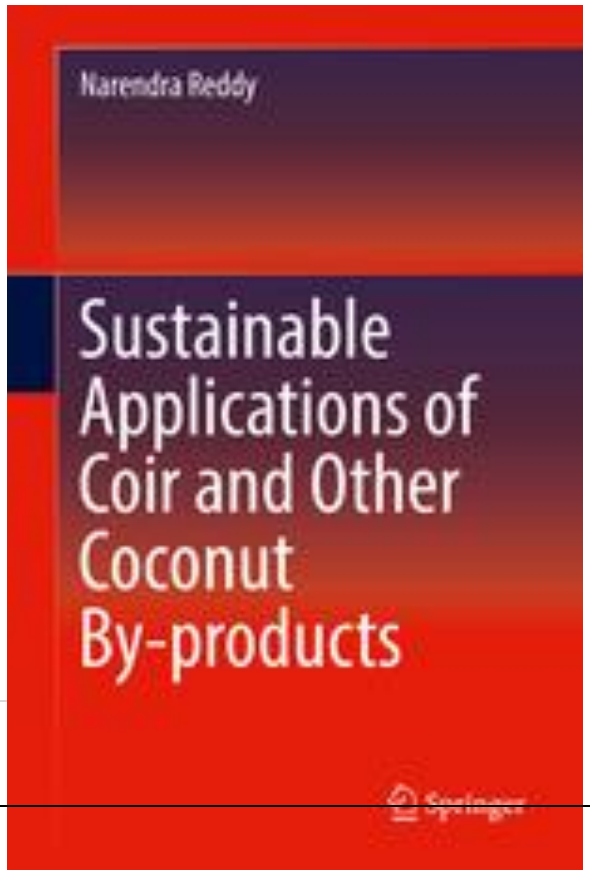
I would also like to extend my gratitude to the principal mam “Dr.A.Nigar akthar” and vice principal mam “Mrs.A.Naaz parwar” and the school

And My Parents for supporting me.

Refrences

- Beattie D.J., White J.W. 1992. Lilium – hybrids and species. In: De Hertogh A.A. and Le Nard M. (eds.), The Physiology of Flower Bulbs. Elsevier, Amsterdam.
- Blom T.J. 1999. Coco coir versus granulated roockwool and 'arching' versus traditional harvesting of roses in a recirculating system. ACTA HORT. 481: 503-507.
- De Hertogh A.A. 1989. Holland bulb forcers guide. Eds. 4. Intern. Flower Bulb Centre, Hillegom, Holland
- https://www.ecopeat.com/raw-cocopeat.html
- https://www.coco-peat.com/
- https://www.coco-peat.com/info/advantages

E-book having info gathered on cocopeat



SOLUBILITY CAPACITY OF DIFFERENT PARACETAMOL COMBINATION

Life Science

Junior Level

SOLUBILITY CAPACITY OF DIFFERENT PARACETAMOL COMBINATION

SCIENCE FAIR PROJECT REPORT

LEVEL	JUNIOR
CATEGORY	LIFESCIENCE

SUBMITTED BY

SWETHA.K

(Grade-9)

FATHIMA CENTRAL SENIOR SECONDARY SCHOOL

SAIDAPET, CHENNAI-600 015

TABLE OF CONTENTS

Chapter	Title	Page no.
1	Abstract	3 to 4
2	Introduction	5 to 6
3	Statement of problem	7
4	Hypothesis	8
5	Design of study	9 to 13
6	Data collections	14 to 22
7	Result	23
8	Discussion	24
9	Conclusion	25
10	Future enhancement	26
11	Acknowledgments	27
12	References	28

ABSTRACT

My question is which paracetamol a dissolve fast and retain the PH of stomach " .I selected 4 different paracetamol combination They are

✓paracetamol + aceclofenac

✓paracetamol + diclofenac

✓Paracetamol+ nimesulide

✓Paracetamol+ibuprofen

✓First I prepared gastric acid.

✓Then i added the tablet correspondingly in test tube A,B,C,D

✓The test tube contains combination of gastric acid ahd hydrochloricacid.

✓ I checked the time taken by the tablet to dissolve and a PH value after it dissolved.

✓ I observed this experiment and noted down the time taken by the tablet to dissolve a PH value after dissolving tablet .BY this we can select A best tablet.

INTRODUCTION:

Medicine in India is transactional. A well-liked doctor hands over a prescription at the end of every visit. Why else have I paid cash to see the doctor, if not for relief? The precariousness of daily life leaves little room for downtime.

As the Indian government reluctantly loosens its prescription opioid laws after decades of lobbying by palliative care advocates desperate to ease their patients' acute pain, the nation's sprawling, cash-fed health care

system is ripe for misuse. The sheer size of India’s system — tens of millions of doctors and pharmacies spread across the subcontinent — makes oversight difficult but presents a tantalizing opportunity for India’s burgeoning pain industry and multinational pharmaceutical companies seeking new markets.

STATEMENT OF THE PROBLEM

i have seen many people consuming painkillers without the prescription of doctor. once I read in one article That

"IN INDIA'S SLUMS PAINKILLERS ARE PART OF THE DAILY ROUTINE"

because these people's don't know the sideeffects of it.

so , i decided to do A research on painkillers. that are commonly used among peoples.

"solubility capacity of different paracetamol combinations"

HYPOTHESES:

My hypothesis is paracetamol+ nimisulide dissolves rapidly sustain PH of stomach.

DESIGN OF STUDY

INDEPENDENT VARIABLE:

different paracetamol tablets.

DEPENDENT VARIABLE:

solubility and PH

CONTROLLED VARIABLE:

acidity of stomach

MATERIALS REQUIRED:

1.test tubes.

2.test tube stand.

3.paracetamol tablets.

4.hydrochloric acid.

5.potassium chloride.

6.water.

7.stop watch.

8. PH value paper.

9.sodium chloride

PROCEDURE:

1.Take 20 ml of prepared gastric acid in each test tube.

2.Label IT AS A,B,C,D.

3.Add tablet(A) to the first test tube.

4.Add tablet B,C,D in the test tubes correspondingly.

5.Start the stop watch

6.Note down the time taken by tablet A,B,C,D TO dissolve completely.

7.Using PH paper find the PH value in each test tube and note it down.

8.Tabulate the readings.

The Normal Volume of the stomach fluid is 20 TO 100ML and the IS acidic (1.5 TO 3.5). these numbers are converted To actual ACID production in units OF milliequivalents per hour(mEq/hr) in some cases.

GASTRIC ACID:gastric acid,gastric juice, or stomach acid IS A digestive fluid a within the a lining with PH between 1 and 3 gastric acid plays A keyrole in digestion of proteins by digestive enzymes, which together breakdown the amino acids OF protein.

PREPARATION OF GASTRIC ACID

✓The concentration of hydrochloric acid in stomach acid IS about 0.155 molar(moles per litre.)

✓Measure 5.6 g of hydrochloric acid.

✓Add water IN A container and mix HYDROCHLORIC ACID to it.

✓Add 5g OF a sodium chloride – 5 g of pottasium chloride.

✓Mix througly.


Aceclofenac
Diclofenac
Nimesulide
+ Ibuprofen


00:14.67


THE FATHIMA MAT. HR. SEC. SCHOOL
CHENNAI-18

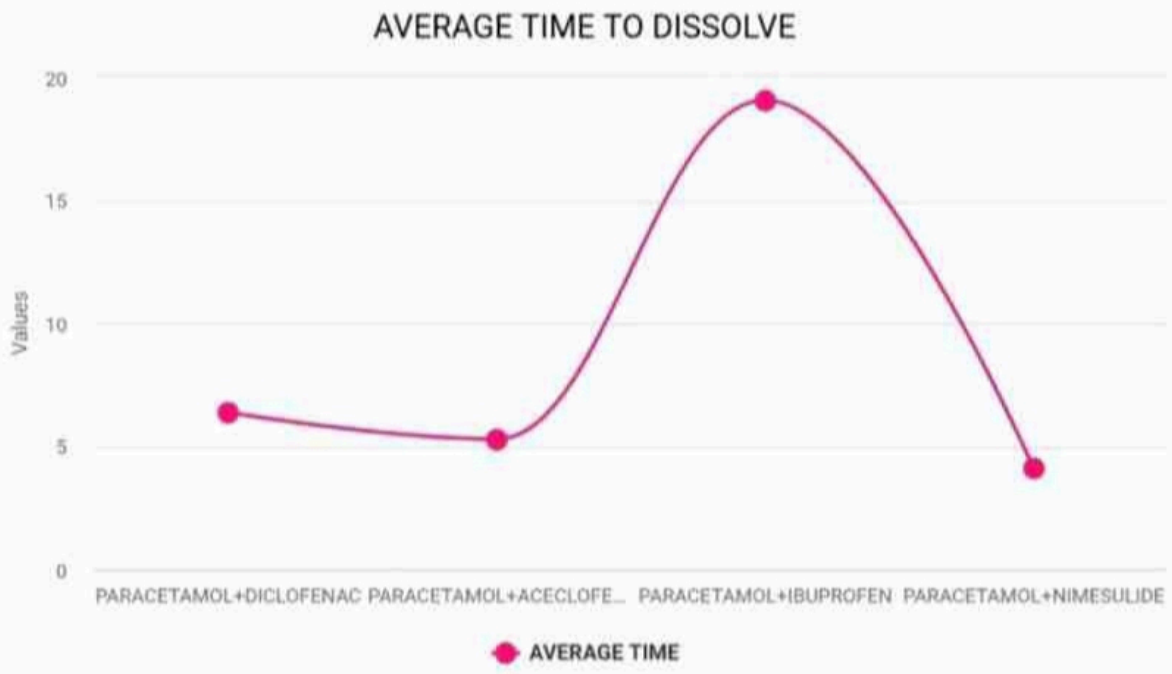

Diclofena
Sod

TABLE 1: TIME TAKEN TO DISSOLVE

SAMPLE TABLETS	TRIAL 1	TRIAL 2	TRIAL 3	AVERAGE
PARACETAMOL +DICLOFENAC SODIUM	6.35	6.38	6.37	6.366
PARACETAMOL + ACECLOFENAC	5.28	5.25	5.30	5.276
PARACETAMOL +IBUPROFEN	19.05	19.07	19.10	19.073
PARACETAMOL +NIMESULIDE	4.06	4.08	4.04	4.06

TABLE 2: Ph AFTER DISSOLVING THE TABLET

SAMPLE TABLETS	TRIAL 1	TRIAL 2	TRIAL 3	AVERAGE
PARACETAMOL +DICLOFENAC SODIUM	1.5	1.5	1.5	1.5
PARACETAMOL +ACECLOFENAC SODIUM	2	2	2	2
PARACETAMOL +IBUPROFEN	2.5	2.5	2.5	2.5
PARACETAMOL +NIMESULIDE	3	3	3	3



✓PARACETAMOL+DICLOFENAC SODIUM =6.366

✓PARACETAMOL+ACECLOFENAC=

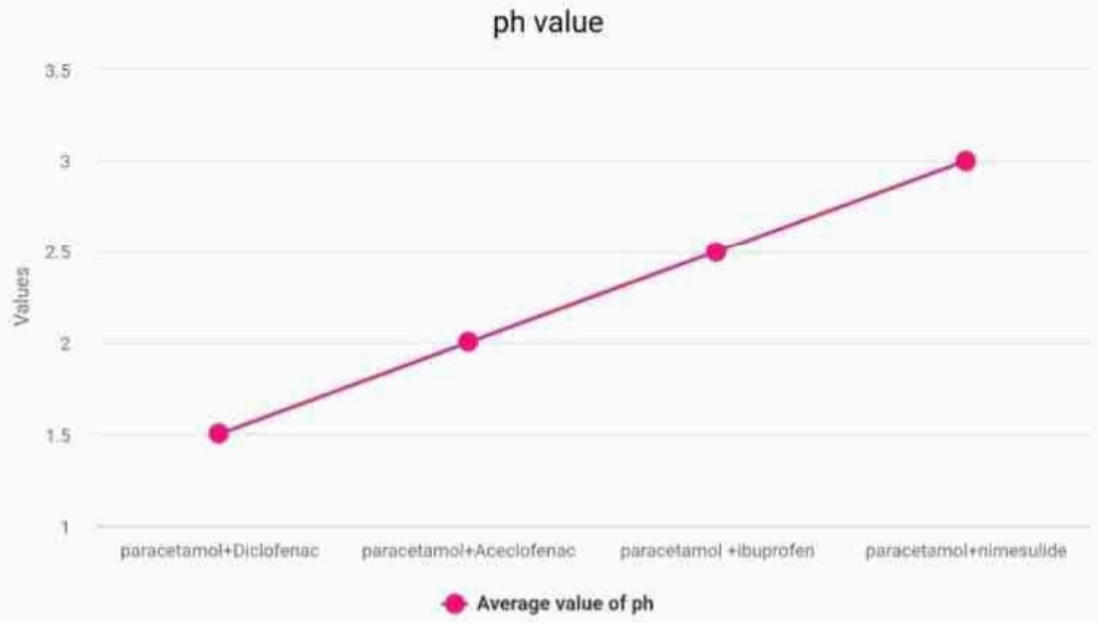
5.276

✓PARACETAMOL+IBUPROFEN=

19.073

✓PARACETAMOL+NIMEISULIDE=4.06

4.06



- PARACETAMOL+DICLOFENAC SODIUM =**1.5**
- PARACETAMOL+ACECLOFENAC= **3**
- PARACETAMOL+IBUPROFEN=**2.5**
- PARACETAMOL+NIMEISULIDE=**3**

RESULT:

After the observation of tabular columns and graphs I found that paracetamol + Nimesulide dissolves at average time of 4.06 minutes and its acidic value is (3 PH) which is less than other combination.

Among the four different types of paracetamol combination maintains the PH of stomach but dissolving time varies accordingly.

DISCUSSION:

I Observed that paracetamol combo tablets are most commonly used in India.The normal volume of human stomach fluid is 20 to100 ml & it's PH is 1.5 to 3.5 (acidic).

From the project we can understand that all the 4 paracetamol combination tablet support in maintaining PH of stomach but the time taken for dissolving changes accordingly.

Among the 4 tablets paracetamol+ Nimesulide tablet dissolves in a short time span in comparison to other tablets.

CONCLUSION: Paracetamol is a well established and anagelsic and antipyretic drug.Therapeutic Response of any formulation depends on its quality parameters . Variations was obtained in hardness ,air integration or dissolution profile . during the test procedure.

Finally,as quality control parameters are related to one another from initial step to pharmacological action of the drug,A high quality tablets should meet all standard quality parameters for getting it's desired therapeutic response.

FUTURE ENHANCEMENT

I want to continue my project by researching about alternatives to painkillers which is not harmful to us.

Acknowledgment

I would like to express my special thanks of gratitude to my teacher "Miss Jyothi priya " for their able guidance and support in completing my project.

I would also like to extend my gratitude to principal mam Dr.Nigar akthar and vice principal mam Naaz Parwar foey providing me with all the facility that was required.

REFERENCES:

https://www.healthline.com/

https://www.ucsfhealth.org/medical-tests/003883

https://medlineplus.gov/ency/article/003883.htm#:~:text=The%20normal%20volume%20of%20the,acidic%20(1.5%20to%203.5).

COMPARATIVE STUDY BETWEEN NORMAL CHILD AND AUTISTIC CHILD

Life Science

Junior Level

COMPARATIVE STUDY BETWEEN NORMAL CHILD AND AUTISTIC CHILD

SCIENCE FAIR PROJECT REPORT

LEVEL : JUNIOR

CATEGORY : LIFE SCIENCE

SUBMITTED BY :

LATHA . P (Grade 10)

(Fathima Central senior secondary school)

Sn:o	TITLE	PAGE : No
1	ABSTRACT	1
2	INTRODUCTION	4
3	DESIGN of study	8
4	RESULT,s	11
5	DISCUSSION	22
6	CONCLUSION	23
7	Acknowledgment	24
8	Reference	25

ABSTRACT :

Δ : My question is that "Autistic child foucs while taking photo"

Δ : Autism is a Brian disorder that limits person ability to communicate related to other people

Δ : Autism spectrum disorder impacts the nerve system and affects the over all cognitive , emotional , social and physical heath of the affected individual

Δ : I visited Autistic centre near my home and I have selected 4 Autistic children of different age groups and I have observed their activities and their behaviour for 10 days

Δ : And near my house I have selected 4 normal children and I have observed their activities and their behaviour for 10 days

Δ : I observed the activities like

✓ : Facing camera

✓ : Taking bath

✓ : Eating habits (and)

✓ : Response to a call

Based on my observations , the autistic children proved to be much less responsive than the normal children....

INTRODUCTION :
My hypothesis " Autistic
child will not face the camera
because I have noticed some students
near by my house that they are not
focus on their work and not giving
attention to camera....

Autism spectrum
disorder(ASD) is a developmental
disability caused by a difference in the
brain scientist do not know yet exactly
what causes this difference for the
most people with ASD. Away some
people is ASD have a known differenc
such as genetic conditions. There are
multiple causes of although most are
not yet known.

Those with ASD typically demonstrate symptoms by two to three years of age. However, many will display signs earlier i development and ASD can be reliably diagnosed around 18 months of age.

Individuals must demonstrate challenges in two domains of functioning: 1) social communication and 2) restricted and/or repetitive patterns of behaviour.

They may repetitively wave their arms or hands, rock or spin when excited. Some children repeat actions over and over, such as turning a light switch on and off. Some focus on small parts of an object (the wheel of a toy car) rather than the entire object (the car).

Others may insistently line objects up — such as toys or family members' shoes — and become distressed if the objects are moved. They may be aggressive towards others or may injure themselves. They often crave predictability and struggle when their routines are disrupted.

Children often become attached to specific objects — such as a block or a notebook that they must carry around with them — yet show little interest in toys. They can become intensely interested in things like door knobs or toilet seats, or become obsessed with a familiar cartoon character or toy.

Hypothesis :

My hypothesis is "autistic child will not face the camera"

Independent variable:

Autistic child and normal child

Dependent variable:

Response of children

Controlled variable

Taking photo , camera

MATERIAL REQUIRED :

✓ : Camera

✓ : Autistic child

✓ : Normal child

✓ : Observation note

PROCEDURE :

√ : Select four children who has the sign of autism

√ : Similarly select four children who has normal behaviour

√ : See to take photos of each and every child using camera

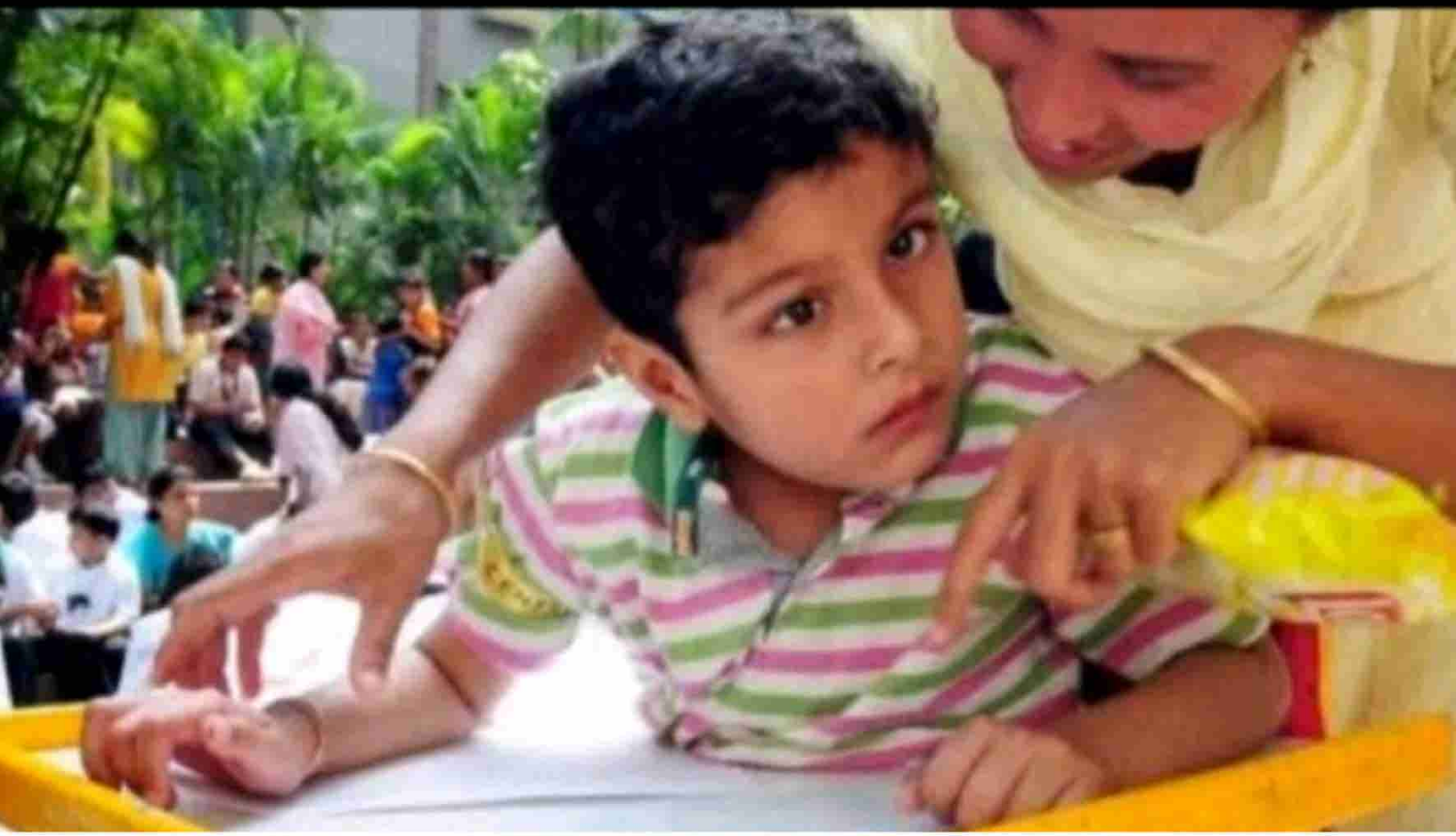
√ : Note down the reaction of each and every child in the observation

√ : Tabulate the reading

RESULT :

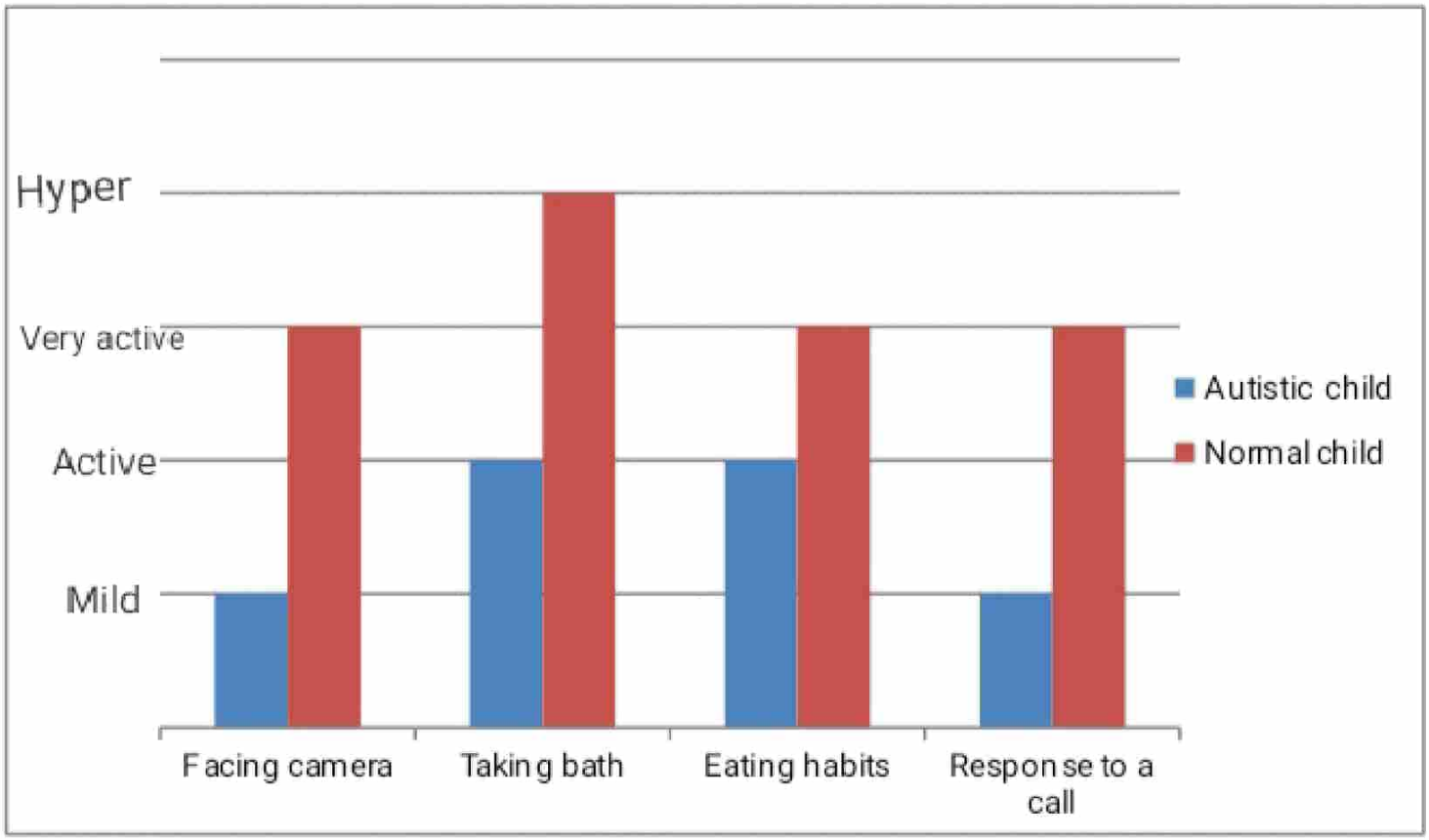
Autistic child

CHILD	Taking photo		
	TRIAL 1	TRIAL 2	TRIAL 3
CHILD:1	No response	No response	No response
CHILD:2	No response	No response	No response
CHILD:3	No response	No response	No response
CHILD:4	No response	No response	No response



NORMAL CHILD

CHILD	Taking photo		
	TRIAL 1	TRIAL 2	TRIAL 3
CHILD:1	Actively participated	Actively participated	Actively participated
CHILD:2	Actively participated	Actively participated	Actively participated
CHILD:3	Actively participated	Actively participated	Actively participated
CHILD:4	Actively participated	Actively participated	Actively particpated


Hyper
Very active
Active
Mild
Facing camera
Taking bath
Eating habits
Response to a call
Autistic child
Normal child

Discussion

✓ : From the above research I determine that autistic child doesn't cooperate while taking photos

✓ : Where as normal child participate actively

✓ : An Autistic child does,nt show eye contact when a person speak to them

✓ : The same reaction we can see while taking photos

✓ : This ignorance can be rectified by a psychological with special training,s

CONCLUSION :

Because of brain disorder the autistic child can't able to focus while taking photo

Normal child focused while taking photo.

My hypothesis "Autistic child " does not support taking photo

" HAS BEEN PROVED "

ACKNOWLEDGMENTS :

I would like to express my special thanks and gratitude to my teacher Mrs. Jothi Priya for their able guidance and support in completing my project

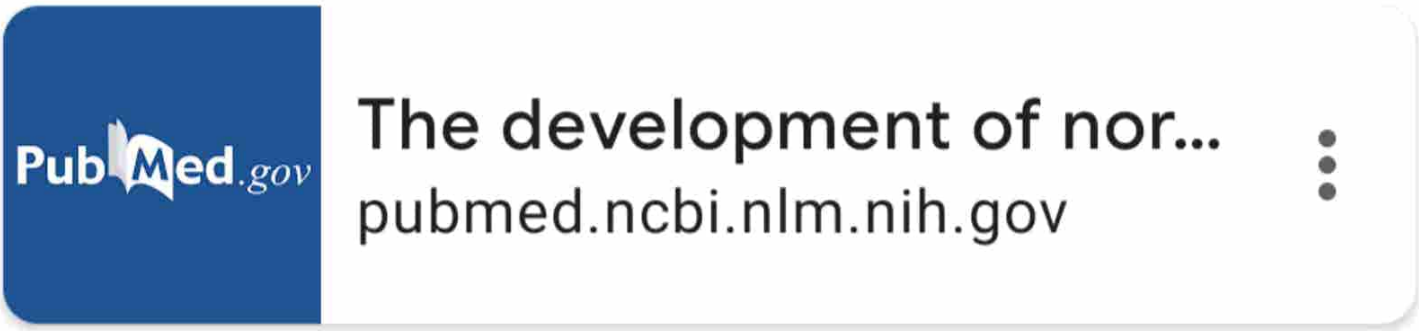
I would also like to extend my gratitude to the principal mam Dr : Nigar akthar and vice principal Naaz Mam for providing me with all the facilities that was required

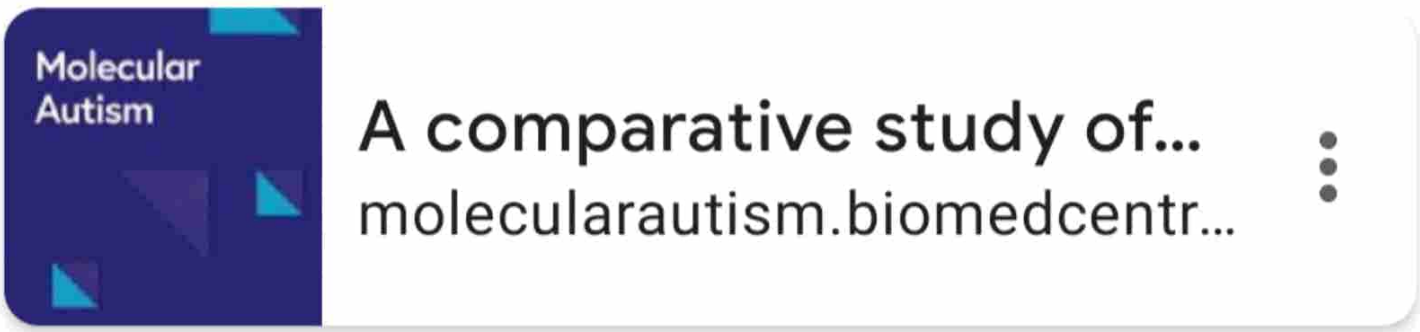
Date Latha
31/3/2021

REFERENCE / BIBLIOGRAPHY

https://molecularautism.biomedcentral.com/articles/10.1186/s13229-019-0304-2

https://wiki.inf.ed.ac.uk/twiki/pub/ECHOES/RelevantPapers/Geest2002.pdf





HOW TO SEE DNA WITH NAKED EYES

Life Science

Junior Level

HOW TO SEE DNA WITH NAKED EYES

SCIENCE FAIR PROJECT REPORT

Level	Middle level
category	Life science

SUBMITTED BY

N.ADHEEBA

9 B

SANA MODEL SCHOOL

HOW TO SEE DNA WITH NAKED EYES

CONTENTS –

Chapter no	title	Pg no
1	Abstract	
2	Introduction	
3	Statement of problem	
4	Hypothesis	
5	Design of study	
6	Collection of data	
7	Result	
8	Discussion	
9	Application	
10	Conclusion	
11	Future enhancement	
12	Acknowledgement	
13	Reference	

ABSTRACT-

DNA, or deoxyribonucleic acid, is contained in all living organisms and is the set of instructions that tell a cell how to build a protein. In the human body, DNA tells the body how to build proteins that makes up hair, skin, muscles, and every organ in your body. DNA is stored in the nucleus of cells. It is an extremely thin molecule averaging about 2 nanometers in width. A nanometer is one-billionth of a meter. To put this in perspective, a human hair is approximately 80,000 nanometers wide. In this activity, you will extract DNA from green split peas. To do this, I will go through a series of steps that include breaking the cell apart, releasing the DNA from the nucleus, and protecting the DNA from enzymes that will shear or break it down. AS I perform this activity, think about why I am performing each of the steps. Finally, explain how you will be able to see DNA when it is 40,000 times smaller than a human hair.

In this activity we will:

• Extract DNA from green split peas and observe with the naked eye

• Analyze the steps taken to extract the DNA

WHAT IS DNA?

Deoxyribonucleic acid, more commonly known as **DNA**, is a complex molecule that contains all of the information necessary to build and maintain an organism. All living things have DNA within their cells. In fact, nearly every cell in a multicellular organism possesses the full set of DNA required for that organism.
However, DNA does more than specify the structure and function of living things — it also serves as the primary unit of heredity in organisms of all types. In other words, whenever organisms reproduce, a portion of their DNA is passed along to their offspring. This transmission of all or part of an organism's DNA helps ensure a certain level of continuity from one generation to the next, while still allowing for slight changes that contribute to the diversity of life.

DNA was first observed by a German biochemist named Frederich Miescher in 1869. But for many years, researchers did not realize the importance of this molecule. It was not until 1953 that James Watson, Francis Crick, Maurice Wilkins and Rosalind Franklin figured out the structure of DNA — a double helix — which they realized could carry biological information.

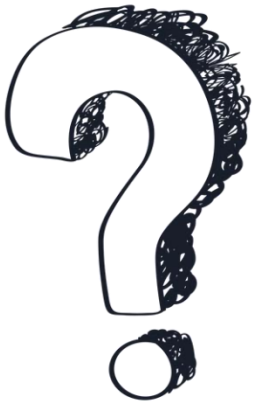
Watson, Crick and Wilkins were awarded the Nobel Prize in Medicine in 1962 "for their discoveries concerning the

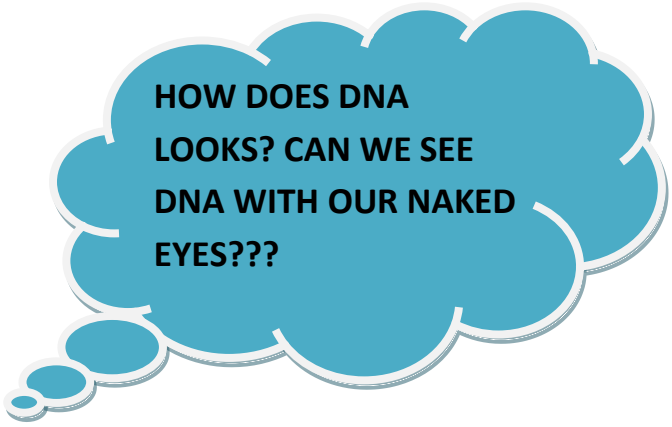
molecular structure of nucleic acids and its significance for information transfer in living material.

DNA molecules are found inside the cells, they are too small to be seen with the naked eye. For this reason, a microscope is needed

STATEMENT OF THE PROBLEM –

Recently I went to the hospital as I was weak in immune system. The doctor reported that it was just a genetic problem. And I was eager to know how this genetic problem occurs and I came to know that it was through DNA and I was eager to know how this DNA looks when I asked my teachers they said that it could be seen only through microscope this was the reason for me to do research on the topic “HOW TO SEE DNA THROUGH NAKED EYES “





HYPOTHESIS-

My hypothesis for this project is if lemon juice or vinegar is used in DNA extraction liquid instead of meat tenderizer powder is the amount of DNA extracted is same or is there any difference. If the VIM liquid detergent is used in extraction of DNA then will I extract more green peas DNA with any other detergent?

INDEPENDENT VARIABLE :
ISOPROPYL ALCOHOL

DEPENDENT VARIABLE :
ACETONE

CONTROLLED VARIABLE
QUALITY PEAS

DESIGN OF STUDY –

Materials

1/2 cup green split peas

• measuring cup

• pinch of table salt

• dish detergent

• meat tenderize[VINEGAR]

• blender

• small clear glass

• strainer

• medium sized bowl

• 1 cup water

• cold 90% or higher isopropyl alcohol

• tablespoon

acetone

Preparation

• Place isopropyl alcohol in refrigerator or freezer about 1 hour prior to performing activity.

• Gather all other material

Place ½ cup of green split peas, 1 cup of water and pinch of table salt into blender.

• Blend on high for approximately 20 seconds.

• Pour the liquid portion of the mixture through the strainer into a medium sized bowl. Do not dump chunks of unblended green split peas into the bowl.

• Add 2 tablespoons of dish detergent to the bowl and stir gently for 2 minutes.

• Let mixture set for approximately 5 minutes.

• Dump part of this solution into a small clear glass only filling the glass half full.

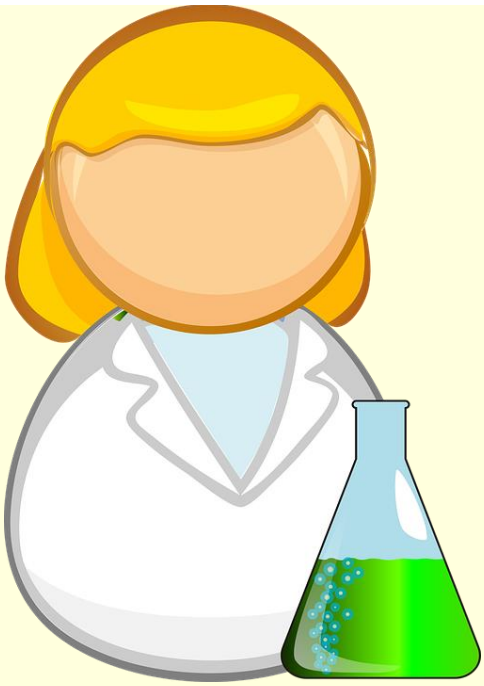
• Add a pinch of meat tenderizer to the liquid in the small clear glass and stir for 15seconds.

• Remove as many bubbles from the solution as possible with a paper towel. The less bubbles in the cup the better the DNA will be seen.

• Slowly pour cold isopropyl alcohol into the small clear glass until the glass is nearly full. Pour alcohol as gently as possible trying not to disturb the mixture that is already in the small clear glass.

• Observe the white, stringy, frothy mixture in the glass- that is your DNA! You may need to let the solution set for several minutes before the DNA becomes visible.

- And second process I am going to use acetone instead of isopropyl I will follow the same steps as I did before for isopropyl alcohol
- Instead of adding isopropyl we will add acetone trying to see DNA



LETS START OUR RESEARCH !!!!!!

LOG BOOK

DAY 1

COLLECTION OF MATERIALS

1/2 cup green split peas

• measuring cup

• pinch of table salt

• dish detergent

• meat tenderize[VINEGAR]

• blender

• small clear glass

• strainer

• medium sized bowl

• 1 cup water

• cold 90% or higher isopropyl alcohol

• tablespoon

acetone

LOG BOOK

DAY 2

PERFORMING THE ACTIVITY :-

• Place isopropyl alcohol in refrigerator or freezer about 1 hour prior to performing activity.

• Gather all other material

Place ½ cup of green split peas, 1 cup of water and pinch of table salt into blender.

• Blend on high for approximately 20 seconds.

• Pour the liquid portion of the mixture through the strainer into a medium sized bowl. Do not dump chunks of unblended green split peas into the bowl.

• Add 2 tablespoons of dish detergent to the bowl and stir gently for 2 minutes.

• Let mixture set for approximately 5 minutes.

• Dump part of this solution into a small clear glass only filling the glass half full.

• Add a pinch of meat tenderizer to the liquid in the small clear glass and stir for 15seconds.

• Remove as many bubbles from the solution as possible with a paper towel. The less bubbles in the cup the better the DNA will be seen.

• Slowly pour cold isopropyl alcohol into the small clear glass until the glass is nearly full. Pour alcohol as gently as possible trying not to disturb the mixture that is already in the small clear glass.

• Observe the white, stringy, frothy mixture in the glass- that is your DNA! You may need to let the solution set for several minutes before the DNA becomes visible.

- And second process I am going to use acetone instead of isopropyl I will follow the same steps as I did before for isopropyl alcohol
- Instead of adding isopropyl we will add acetone trying to see DNA

OBSERVATION

DEPENDENT VARIABLE :ISOPROPYL ALCOHOL

TEST SAMPLE INFERIOR PEAS	CONTROL SAMPLE GOOD QUALITY PEAS
 INFERIOR	

INDEPENDENT VARIABLR ACETONE :

TEST SAMPLE I- INFERIOR PEAS	CONTROL SAMPLE –GOOD QUALITY PEAS
	

COLLECTION OF DATA-

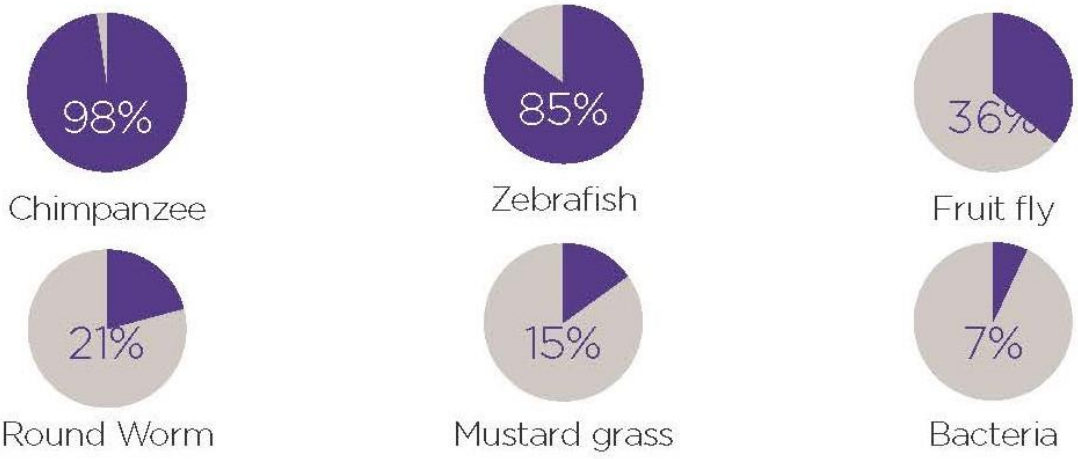
All living things have DNA: the chemical instructions on how to make a living thing, from humans to GREEN PEAS

Many people assume that because DNA is so small, we can't see it without powerful microscopes. But in fact, DNA can be easily seen with the naked eye when collected from thousands of cells.

What does DNA do?

Our genes are made up of DNA, and DNA contains our unique genetic code.
Like a recipe book or instructions for lego , DNA holds the instructions for making all our proteins, which do all the jobs in our bodies

How much DNA do you share with these living things?



Why do we use the dishwashing liquid?

The dishwashing liquid bursts open the cells of the strawberries, releasing the DNA.

Why do we use the salt?

It ensures that the proteins in the cell are kept separate from the DNA.

What does the alcohol do?

When molecules are insoluble (unable to be dissolved), they clump together and become visible. DNA is not soluble in alcohol; therefore, it makes the DNA strands clump together and become visible to the naked eye.

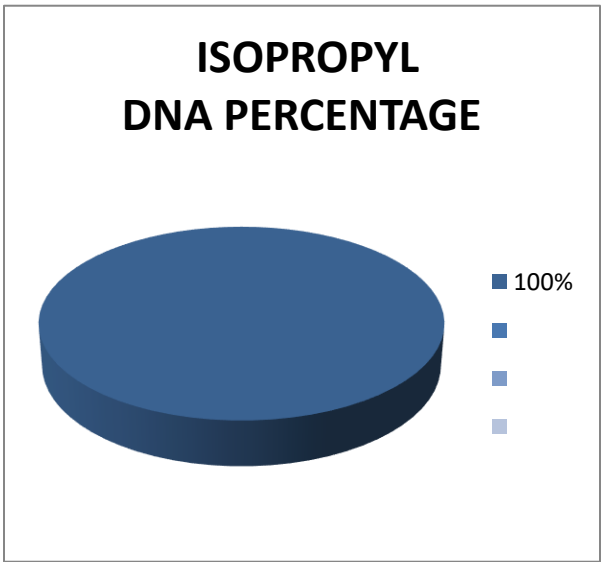
RESULT –

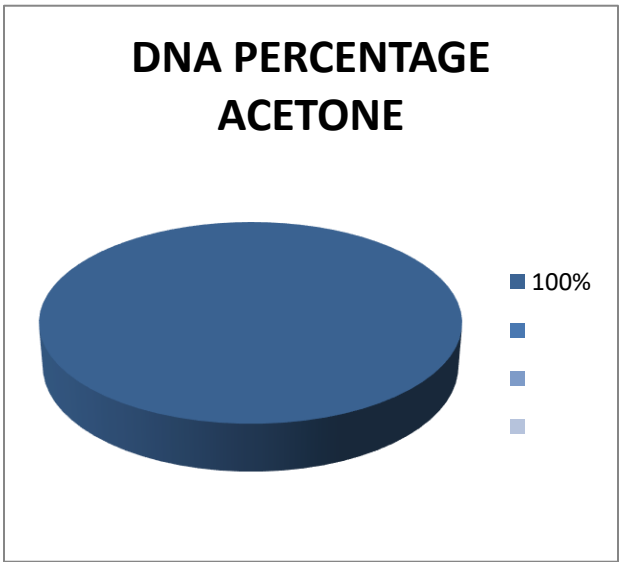
Observations and results

When you added the salt and detergent mixture to the split green peas mixture the detergent helped lyse (pop open) the strawberry cells, releasing the DNA into solution, whereas the salt helped create an environment where the different DNA strands could gather and clump, making it easier to see them. (When I added the salt and detergent mixture, probably mostly just saw more bubbles form in the bag because of the detergent.) After I added the cold isopropyl alcohol to the filtered green peas liquid, the alcohol should have precipitated the DNA out of the liquid while the rest of the liquid remained in solution. I saw the white/clear gooey DNA strands in the alcohol layer as well as between the two layers. A single strand of DNA is extremely tiny, too tiny to see with the naked eye, but because the DNA clumped in this activity you were able

see it

WE ALSO OBSERVED THAT USING ACETONE AND ISOPROPYL ALCOHOL GIVES THE SAME RESULT AND AMOUNT OF DNA


ISOPROPYL
DNA PERCENTAGE
100%


DNA PERCENTAGE
ACETONE
100%

DISCUSSION –

From my project “HOW TO SEE DNA WITH NAKED EYES ” I read that many people assume that DNA is so small it can observed only with the help of microscope but it now proven that DNA can be also seen with the naked eyes in vegetables such as green split peas

Why do we use the dishwashing liquid?

The dishwashing liquid bursts open the cells of the strawberries, releasing the DNA.

Why do we use the salt?

It ensures that the proteins in the cell are kept separate from the DNA.

What does the alcohol do?

When molecules are insoluble (unable to be dissolved), they clump together and become visible. DNA is not soluble in alcohol; therefore, it makes the DNA strands clump together and become visible to the naked eye.

APPLICATION –

Every person has DNA. DNA, or deoxyribonucleic acid, is the hereditary material in humans and almost all other organisms. Nearly every cell in a person's body has the same DNA. Most DNA is located in the cell nucleus (where it is called nuclear DNA), but a small amount of DNA can also be found in the mitochondria (where it is called mitochondrial DNA). Mitochondria are structures within cells that convert the energy from food into a form that cells can use.

By using this research people could be able to see the DNA without any advanced technical device just by simple method this can be implemented in schools which help children to learn about DNA more easily .

CONCLUSION :-

After this activity, I came to knew the steps needed to extract DNA from green split peas. I also understood the point of each step. The blending breaks the cell open, the soap and salt release the DNA from the nucleus, the meat tenderizer prevents enzymes from breaking down the DNA, and the DNA is not soluble in alcohol so it precipitates out at the water and alcohol boundary. we may also try extracting DNA from other fruits or vegetables. Finally, I understood that the DNA which is seen is not individual strands but a tangled mass of all the DNA that is present in a cell's nucleus.My hypothesis on this topic on using vinegar instead of meat tenderizer power has been proven and it is the same case for using vim liquid detergent instead of other detergent

And it is also seen that using of acetone in place of isopropyl gives the same result and use of inferior peas and good quality peas has the different in the amount of DNA observed

FUTURE ENHANCEMENT:-

The extraction of DNA is pivotal to biotechnology. The ability to extract DNA is of primary importance to studying the genetic causes of disease and for the development of diagnostics and drugs. It is also essential for carrying out forensic science, sequencing genomes, detecting bacteria and viruses in the environment and for determining paternity.

Till data it has been proven that DNA can be seen with our naked eyes in fruits and vegetables. In future I like to continue my research on seeing DNA on other fruits and vegetable I also like to extend my project on seeing DNA of human beings in future with naked eyes which helps to cure more genetic disorders.

ACKNOWLEDGEMENT

In a warm – hearted state and with intense pleasure ,I bow myself and adore the ALMIGHTY for his grace and immeasurable blessing showered upon me all throughout my life

I would like to express my special thanks of gratitude to my chemistry teacher Mrs survath jabeen and **mrs reshma naaz for their able guidance and support in completing my project**

I also like to extend my gratitude to the principle ma'am who gave me the golden opportunity to do this wonderful project on topic "how to see DNA with naked eyes " which also helped me in doing a lots of research and I came to know about so many new things

I am really thankful to them

Secondly I would like to thank my parents and friends who helped me a lot in finishing this project within the time limit

I am making this project not only for marks but to also increase my knowledge

THANKS AGAIN TO ALL WHO HELPED ME

REFERANCE :-

https://www.1000sciencefairprojects.com/Biology/how-to-see-dna.php

http://gslc.genetics.utah.edu/units/activities/extraction/

http://www.accessexcellence.org/AE/AEC/CC/DNA_extractions.html

STUDY ON VEGETAL (Herbal) SANITIZER AND IT'S PREPARATION

Life Science

Senior Level

STUDY ON VEGETAL (Herbal) SANITIZER AND IT'S PREPARATION.

SCIENCE FAIR PROJECT REPORT

Level	:	Senior level
Category	:	Life science

Submitted by:

S.SUREGA (GRADE 11)

(FATHIMA CENTRAL SENIOR SECONDARY SCHOOL)

TABLE OF CONTENTS:

S.no.	Title	Page no.
1	Abstract	3
2	Introduction	4
3	Statement of problem	4
4	Hypothesis	7
5	Design of study	8
6	Procedure	11
7	Result	22
8	Discussion	26
9	Conclusion	27
10	Acknowledgment	29
11	Reference	30

***ABSTRACT*:**

Preparation of vegetal sanitizer with natural ingredients and microbiological study of the prepared Sanitizer has been done to find “Whether herbal sanitizer is effective on inhibiting bacterial colonies”.

***INTRODUCTION*:**

STATEMENT OF THE PROBLEM

The main aim for the preparation of a vegetal hand sanitizer is for “Hand hygiene” particularly during this COVID-19 period. The sanitizers that are

made chemically can cause a lot of skin diseases and allergies, when used frequently. Alcohol based hand sanitizer can wash away skin’s natural oils and cause drying, cracking and irritations.

So that I have replaced camphor instead of Alcohol and tried to make the vegetal sanitizer more effective and harmless.

HYPOTHESIS:

The prepared vegetal sanitizer will kill microbes and it won't cause any skin disease.

DESIGN OF STUDY

INDEPENDENT VARIABLE: Culture plate with sanitizer and without Sanitizer. Control plate.

DEPENDENT VARIABLE: Agar medium

CONTROLLED VARIABLE:

Growth of bacterial colonies

MATERIALS:

- Neem leaves
- Basil leaves
- Aloevera gel
- Camphor

- Ginger
- Alum
- Pepper
- Petri dish
- Nutrient agar medium
- Inoculation loop
- Bunsen burner

PROCEDURE:

Preparation of sanitizer

- Take one litre of water
- Add Neem leaves, Basil leaves and ginger and boil it thoroughly.
- Mix aloevera gel and boil the water.

- Add camphor,Alum and minimal amount of pepper and boil the mixture till it attains one fourth of the volume.
- Allow the mixture to cool completely and filter.

- Transfer it to a container

Nutrient agar medium preparation

- Measure the recommended amount of agar and

distilled water in a sterile flask

- Using heat resistant hand protection, hold the beaker/flask over the flame and stir the mixture gently using a sterile stir rod while heating.

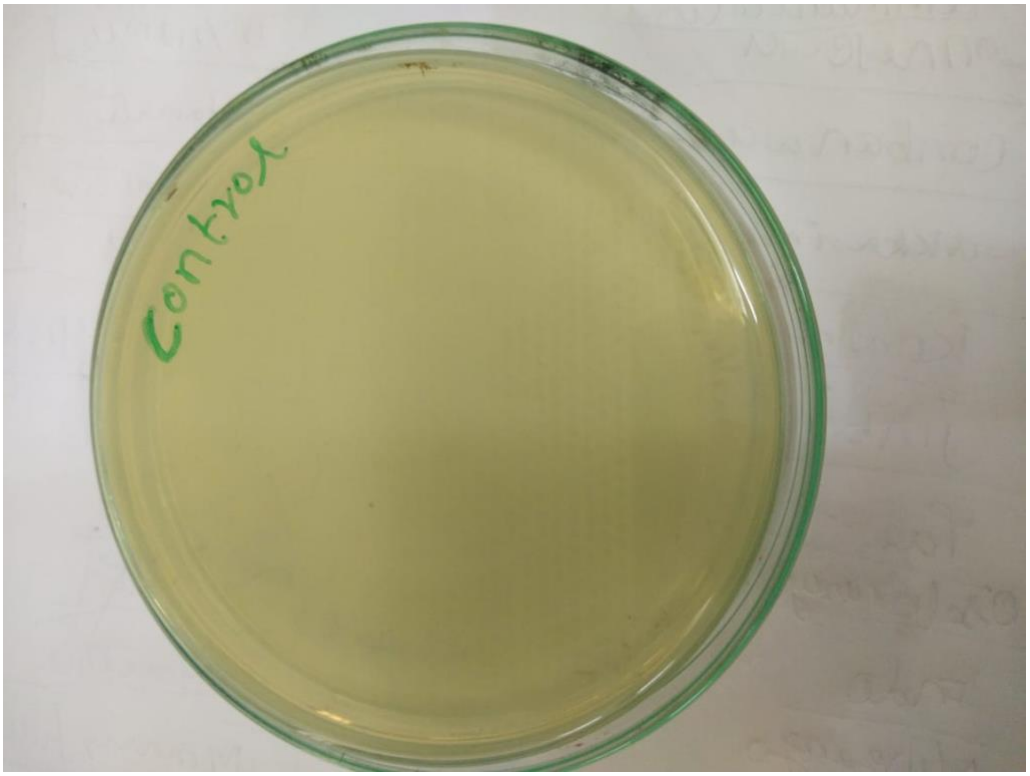
- Continue heating the mixture for about, one minute and then remove from heat.
- Place a sterile lab thermometer in the mixture and monitor until it’s

temperature fall to about 47°C .

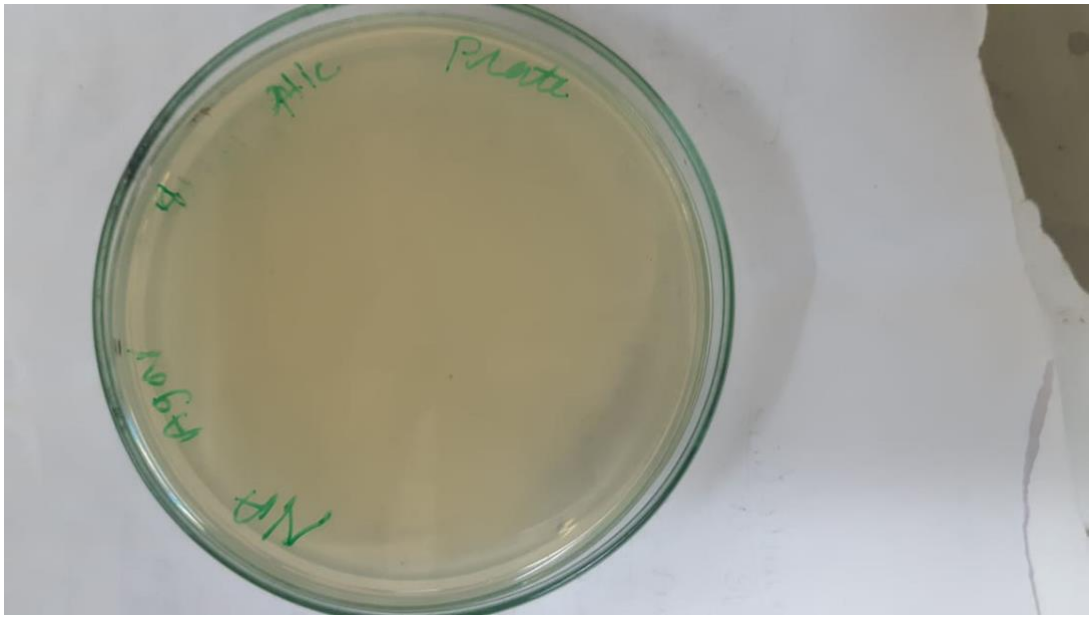
- Pour melted agar into the Petri dish to cover the bottom and replace the lid immediately.
- Allow the agar plate to cool and set.

- Ready for bacterial streaking once it sets.
- Following the above procedure prepare three agar plates.
- Label it as controlled, with sanitizer and without sanitizer.

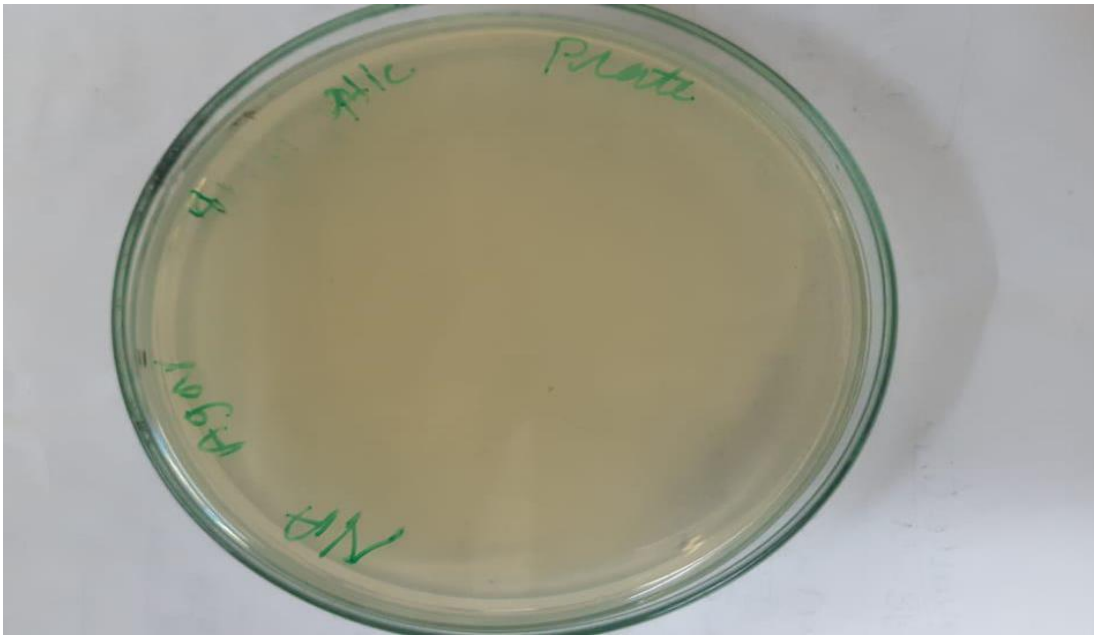
CONTROL:



WITH SANITIZER:



WITHOUT SANITIZER:



Streak plate technique

- Sterilize the inculcating loop in the Bunsen burner.

- Pick isolated colonies from agar plate culture and spread it in the Petri dishes labelled as with sanitizer and without sanitizer.

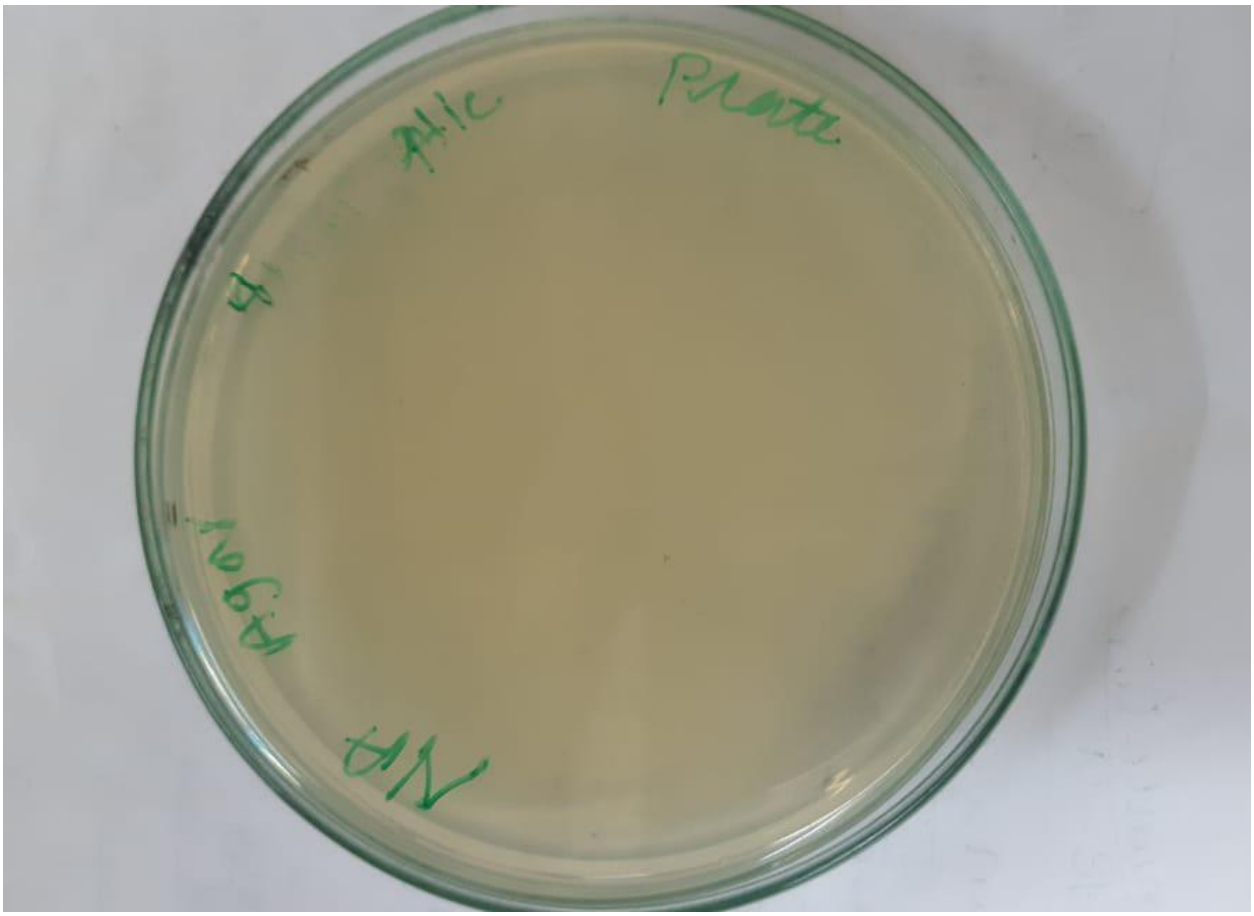
- The streaked plate is incubated at 37°C for 24 hours.
- Examine and compare the growth of Bacterial colonies in the Petri dish.

RESULT:

After incubation, I observed that in Petri dish with sanitizer there is no bacterial colonies developed. But in Petri dish without sanitizer we can see the growth of bacterial colonies.

Petri dish without Sanitizer:

Petri dish with sanitizer:



Petri dish	Trial one	Trial two	Trial three
Control	Nil	Nil	Nil
With sanitizer	No bacterial colonies developed	No bacterial colonies developed	No bacterial colonies developed
Without Sanitizer	Growth of bacterial colonies was observed	Growth of bacterial colonies was observed	Growth of bacterial colonies was observed

DISCUSSION: On the basis of the result, we can understand that the vegetal sanitizer don’t support bacterial growth. Also it is safe to use. This project can be further experimented with

different set of herbal ingredients.

CONCLUSION: My hypothesis “Herbally prepared sanitizer won’t cause any type of skin disease or allergy”

has been proved. Instead of using chemically made sanitizers which may cause skin diseases, this vegetal sanitizer can be used which is very effective and doesn’t harm our skin.

ACKNOWLEDGMENT

I would like to express my Special thanks of gratitude to my guide teacher “Mrs.Suharlatha” and “Mrs.Annie ruth heleena” For their able guidance and support in completing my project.

I would also like to extend my gratitude to the principal mam “Dr.A.Nigar akthar” and vice principal mam “Mrs.A.Naaz parwar” and the school

management for providing me with all the facilities that was required.

REFERENCE:

- www.healthline.com
- www.pinterest.com
- www.diynatural.com

PROTEIN EXTRACTION AND ESTIMATION

STUDIES OF SPINACH, MORINGA, CABBAGE AND METHI LEAVES

Life Science

Senior Level

PROTEIN EXTRACTION AND ESTIMATION STUDIES OF SPINACH, MORINGA, CABBAGE AND METHI LEAVES

SCIENCE FAIR PROJECT REPORT:

Level	Senior level
Category	Life science

SUBMITTED BY :

GOWTHAM J

(Grade 11)

FATHIMA CENTRAL SENIOR SECONDARY SCHOOL

PROTEIN EXTRACTION AND ESTIMATION STUDIES OF SPINACH, MORINGA, CABBAGE AND METHI LEAVES

CONTENTS :

S.NO	TITLE	PAGE NO.
1	Abstract	**3**
2	Introduction	**4**
3	Statement of the problem	**5**
4	Hypothesis	**6**
5	Design of study	**7**
6	Collection of data	**12**
7	Result	**20**
8	Discussion	**24**
9	Conclusion	**25**
10	Application	**26**
11	Future Enhancement	**27**
12	Acknowledgement	**28**
13	Reference	**29**

ABSTRACT :

My question is which is leafy vegetables like spinach, moringa, methi, and cabbage have high protein content. So that protein helps in building muscle repairing tissues and it has several advantages so it is important to eat the correct leafy vegetable to gain protein.

For finding the result of protein concentration in each leafy vegetable the leafy vegetables are made into powders for testing in lab and the colorimeter helps to find the protein content of the leafy vegetable.

INTRODUCTION :

This project is about which leafy vegetables contain high protein content. it is a comparative study among four vegetables and the result gives you that which leafy vegetable contains high protein content. This idea came to me when I researched more and more about the advantages of eating leafy vegetables and also about the advantages of the intake of protein. some of the leafy vegetable can also be grown in house and cultivated. Leafy vegetables are easy to grow.

STATEMENT OF THE PROBLEM:

Nowadays people are eating leafy vegetables without knowing the protein present in it. The studies shows that which leafy vegetable contain high protein content. So it is necessary to know about the protein content before eating leafy vegetable.

HYPOTHESIS :

My hypothesis is among all the leafy vegetable spinach, moringa, cabbage and methi leaves moringa leaves contains high protein content as compared to the other four leafy vegetables.

DESIGN OF STUDY

INDEPENDENT VARIABLE :

Spinach leaves

Moringa leaves

Cabbage leaves

Methi leaves

DEPENDENT VARIABLE :

Protein content

CONTROLLED VARIABLE :

Leafy vegetables

MATERIALS REQUIRED :

- Spinach leaves
- Moringa leaves
- Cabbage leaves
- Methi leaves
- Test tubes
- Brad Ford’s reagent
- Calorimeter
- Observation note

PROCEDURE :

1. Prepare the sample solution of above-mentioned leafy vegetables and label it accordingly.

2. Prepare a blank by adding 1ml of buffer solution to a test tube.

3. Add 1ml of each samples in separate test tubes.

4. To each test tubes add 1ml of Bradford's solution and mix.

Buffer Solutions

(Buffer's solution)

5. Let the samples incubate at room temperature for 5 – 45 minutes.

6. Transfer the samples to colorimetric tubes.

7. Place each test tube in colorimeter and note down the reading.

8. Tabulate the readings.

COLLECTION OF DATA :

I collected the data of the protein content of the following leafy vegetables

SPINACH :

Protein Content : 28.6

- 10 Health Benefits of Spinach:
- Prevents Cancer
- Reduces Blood Sugar
- Aids in Good Bone Health
- Aids in Weight Loss
- Good For Your Eyes
- Reduces Hypertension
- Has Anti-inflammatory Properties
- Keeps Your Body Relaxed

Spinach (Spinacia oleracea) is a leafy green vegetable that originated in Persia. It belongs to the amaranth family and is related to beets and quinoa. What's more, it's considered very healthy, as it's loaded with nutrients and antioxidants.

MORINGA :

Protein content : 31.1

- Moringa tree is also known as the ‘miracle tree’ and there is a good reason why. The leaves, fruit, sap, oil, roots, bark, seeds, pod and flowers of the tree have medicinal properties. The products from the tree have many uses. It is also known as the ‘drumstick tree’. It is found mostly in Asia, Africa, and South America.

- Moringa Leaves – High in Nutrients
- The moringa leaves are nutritionally very rich, leaving behind carrots, oranges and even milk in terms of nutrition value. The leaves find many uses in Indian cuisine as they are versatile and can be

incorporated in the diet in many ways. Adding them to juices and using them as a stir-fry vegetable are the most common ways in which they are eaten. When consumed in their natural form, the moringa leaves have no side effects. Read on to find out more about the health benefits of moringa leaves.

CABBAGE :

Protein content : 13.9

Cabbage is one among those leafy vegetables that are rich in vitamins and minerals. It belongs to the broccoli and cauliflower family of leafy vegetables that is said to have originated from Eastern Mediterranean and Asia Minor.

METHI : 23.9

Protein content :

Health Benefits of having Fenugreek Leaves (Methi Leaves)

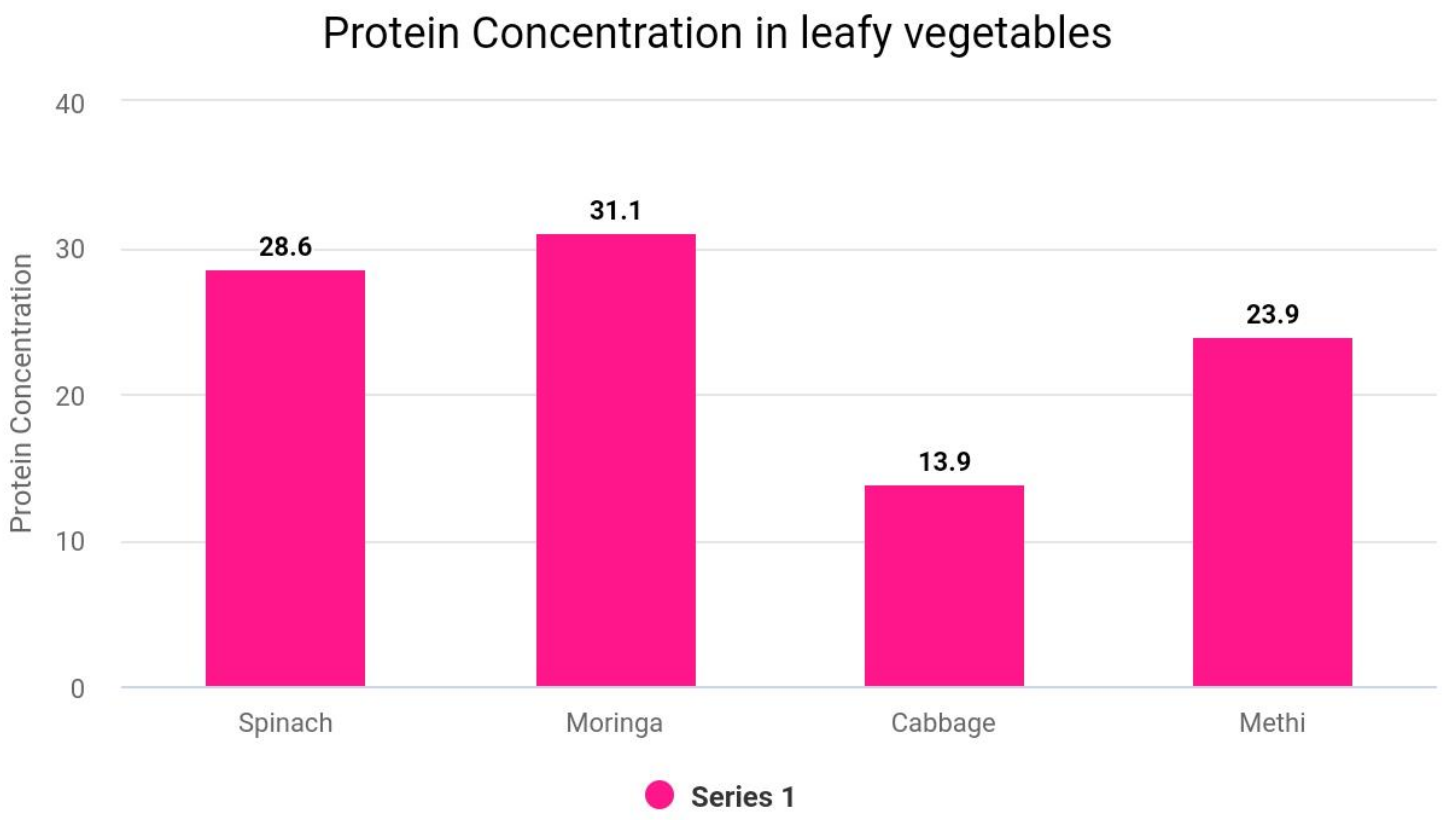
- Strong **Antioxidant**
- Bone Health
- Good for Digestive System
- Cures Mouth Ulcers
- Stimulates Breast Milk Production.
- Good for **Heart**.
- Prevents Anaemia.

RESULT :

Name of leafy vegetables	Sample in (ml)	Bradford's reagent (ml)
Spinach	1 ml	1ml
Moringa	1ml	1ml
Cabbage	1ml	1ml
Methi	1ml	1ml

Name of leafy vegetables	Protein concentration :			
				Avg
Spinach	28.62	28.58	28.61	28.6
Moringa	31.42	31.38	30.72	31.1
Cabbage	14.03	13.90	14.01	13.9
Methi	24.06	23.80	24.03	23.9

GRAPH :


Protein Concentration in leafy vegetables
Protein Concentration
40
30
20
10
0
28.6
31.1
13.9
23.9
Spinach
Moringa
Cabbage
Methi
Series 1

COLORIMETER :

DISCUSSION :

On the basis of the result, we can understand that moringa leaves have high protein content than the other leafy vegetables. We can also able to know the benefits of taking protein. Protein helps mainly in preparing tissues and building muscles. I can also make a awareness fore people about the importance of the intake of protein in everyday life.

CONCLUSION :

I conclude that it is preferred to eat moringa leaves than other leafy vegetables to gain protein that helps to build muscle and has many benefits.

APPLICATION :

By the intake of protein in our daily life it give the following benefits to us

- Transporting molecules throughout the body.
- Helping repair cells and make new ones.
- Protecting the body from viruses and bacteria.
- Promoting proper growth and development in children, teenagers, and pregnant women

FUTURE ENHANCEMENT :

This project can be continued in future for make people aware of the importance of intaking protein. This project can be continued in future and we can also make deep and clear research about the project.

ACKNOWLEDGEMENT :

Have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

I am highly indebted to Mrs.Suharlatha for her guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project. I also thank our principal mam Dr.A.Nigar akthar and Mrs.Naaz parwer.

My thanks and appreciations also go to my teachers Mrs.Annie Ruth haleen who guided me in developing my project and people who have willingly helped me out with their abilities.

REFERENCE :

- https://www.medicalnewstoday.com/articles/318600#:~:text=Spinach%20is%20one%20of%20the,of%20protein%20and%2023%20calories.
- https://www.healthline.com/health/food-nutrition/19-high-protein-vegetables
- https://www.myfooddata.com/articles/vegetables-high-in-protein.php
- https://link.springer.com/article/10.1023/A:1011873119620
- https://www.google.com/amp/s/m.timesofindia.com/life-style/food-news/5-common-vegetables-that-are-rich-in-

protein/amp_etphotostory/77004103.cms

- https://en.m.wikipedia.org/wiki/Leaf_protein_concentrate

- https://www.healthline.com/health/food-nutrition/19-high-protein-vegetables

- https://www.theactivetimes.com/healthy-living/nutrition/6-health-benefits-eating-more-protein

OREGANO OIL AND ITS ANTI-MICROBIAL EFFECTS

Life Science

Senior Level

OREGANO OIL AND ITS ANTI-MICROBIAL EFFECTS

SCIENCE FAIR PROJECT REPORT

Level	:	Senior level
Category	:	Life Science

Submitted by

Juveria

(Intermediate Second Year)

Noesis Junior College

(Tolichowki Hyderabad)

PROJECT PROTOCOL

PRINCIPAL INVESTIGATOR

Juveria

Intermediate II Year (BiPC)

Noesis Junior College

Tolichowki

SUPERVISOR

Mrs.Gafoor Unissa

Lecturer

Department of Botany

Noesis Junior College

Tolichowki

INDEX

S.NO.	Title	Page No.
1	Abstract	1
2	Introduction	2-3
3	Hypothesis	4
4	Research Question	5
5	Variable	6
6	Material Required	7
7	Discussion	8-9
8	Method 1	10
9	Method 2	11
10	Conclusion	12
11	Result	13
12	Graph	14
13	Acknowledgement	15
14	Reference	16
15	Photo’s	17-18

1. For my project oregano oil and its anti-microbial effects for that I have taken six bacteria. Among six three are from gram positive (+) and remaining three are from gram negative (-) and one is (candida fungai). After doing my experiment I had concluded that oregano oil has an anti-bacterial as well as anti-fungal effects A wide range of medicinal and aromatic plants (MAPs) have been explored for their essential oils in the past few decades. Essential oils are are complex volatile compounds, synthesized naturally in different plant parts during the process of secondary metabolism.

2. Essential oil of oregano are widely recognised for their anti-microbial activity, as well as there antiviral and antifungal properties. Nevertheless, recent investigations have demonserated that these compounds are also potent antioxidant, anti-inflammatory, antidiabetic and cancer suppressor agents. Oregano essential oil, which is much more concentrated and used aromatherapy it is applied to the skin. For skin conditions carvacrol is the most abdundant phenol in oregano oil, thymol is the natural antifungal that supports immune system. To be an effective treatment for common candida fungai infection. Candida causes several types of infections, yeast infections.

Oregano and other herbs provide antioxidants. Dietary antioxidants help the body eliminate free radicals. Which are toxic substance that result from natural processes and environmental stresses. A buildup of free radicals can trigger oxidative. stress. Oxidative stress can lead to cell damage that may result in various diseases. Including cancer and diabetes. Some of the ingredients in oregano may have anti-cancer properties. Scientists have found evidence that extracts may help prevent DNA damage in cells due to oxidative stress, radiation, and mitogens, a type of proteins that can cause unwanted cells division. Researchers have also found evidence that carvacrol and thymol may prevent melanoma cells from growing and skin cancer from spreading. While eating oregano by itself is unlikely to prevent cancer, a varied, plant – base diet that rich anti-oxidants may help prevent cell.

3. Oregano oil has an antibacterial, antifungal effect.

4. Does oregano oil have an antibacterial and antifungal effects.

Independent variable : Oregano oil.

Dependent variable : Fungai bacteria.

Control variable : Timing, temperature, Agar medium, antibiotic disc (0.005ml) (6mm in diameter).

- Antibiotic disc
- Agar petri dish
- Bacteria (gram +)
- Bacteria (gram -)
- Fungai (candida)
- BOD Incubator
- Autoclave
- Hot air oven
- Oregano oil disc
- Laminar flow
- Weighing machine
- Sterile bud

The main components of oregano essential oil are carvacrol and thymol. These may have antimicrobial properties. In a 2019 laboratory study .Carvacrol and thymol prevented various strains of Staphylococcus aureus (S.aureus) bacteria from developing in meat and dairy products, suggesting that it could help control bacterial growth in foods. Amid growing concerns about diseases becoming resistant to antibiotics, researchers carried out lab tests to investigate the effects of oregano oil on various microbes that do not respond to other drugs. The oil showed “significant antibacterial activity” against 11 such microbes. This suggests that substances in oregano could play a role in fighting diseases.

Oregano oil is one of the most powerful anti-bacterial essential oil because it contains carvacrol and thymol, two antibacterial and antifungal compounds in fact, research shows oregano oil is effective Against many clinical strains of bacteria, including E.coli. Carvacrol, thymol, and Y-terpinene. Hot water extract had the strongest antioxidants properties and the highest phenolic content were ineffective in inhibiting the growth of 3 tested bacteria and one fungi. Oregano contain vitamin A, K and C it also treat respiratory track conditions such as cough, asthma, croup.

- Take 3 petri dish mark each of them with A,B,C,
- Take a appropriate amount of bacillus subtilis on sterile bud and spread gently on “A” petri dish.
- Simultaneously take bacillus cereus, proteus vulgaris on sterile bud and spread gently on petri dish “B” and “C”.
- Take 3 more petri dish for gram (-ve) mark each of them with D,E,F.
- Take an appropriate amount of E.coli on sterile bud and spread gently on D petri dish.
- Simultaneously take pseudomonas aeruginosa and staphylococcus aureus on sterile bud spread gently on their respective petri dish “E” and “F”.
- Take a petri dish and mark “G” on it and take a lumsum amount of candida fungai on sterile bud and spread all over the petri dish.
- Put all the seven petri dish in a BOD INCUBATOR for 72 hr to see the accurate result.

- After the bacterial growth.
- Take 7 petri dish for gram (+ve), gram (-ve), fungai mark it with 1, 2, 3, 4, 5, 6, 7.
- Inoculate the bacterial colony from petri dish A, B, C, D, E, F, G, into 1, 2, 3, 4, 5, 6, 7, petri dish.
- After inoculating the bacterial colony in their respective petri dish.
- Put antibiotic disc (Penicillin) (PIT) (OREGANO OIL DISC) (CIP) (IPM) (CD).
- Simultaneously put all the 3 antibiotic and oregano oil disc in all 7 petri dish.
- Make four columns on the lid of petri dish.
- Mark it with antibiotic name.
- Gently put all the 7 petri dish in BOD INCUBATOR for 72 hr to get the accurate result.

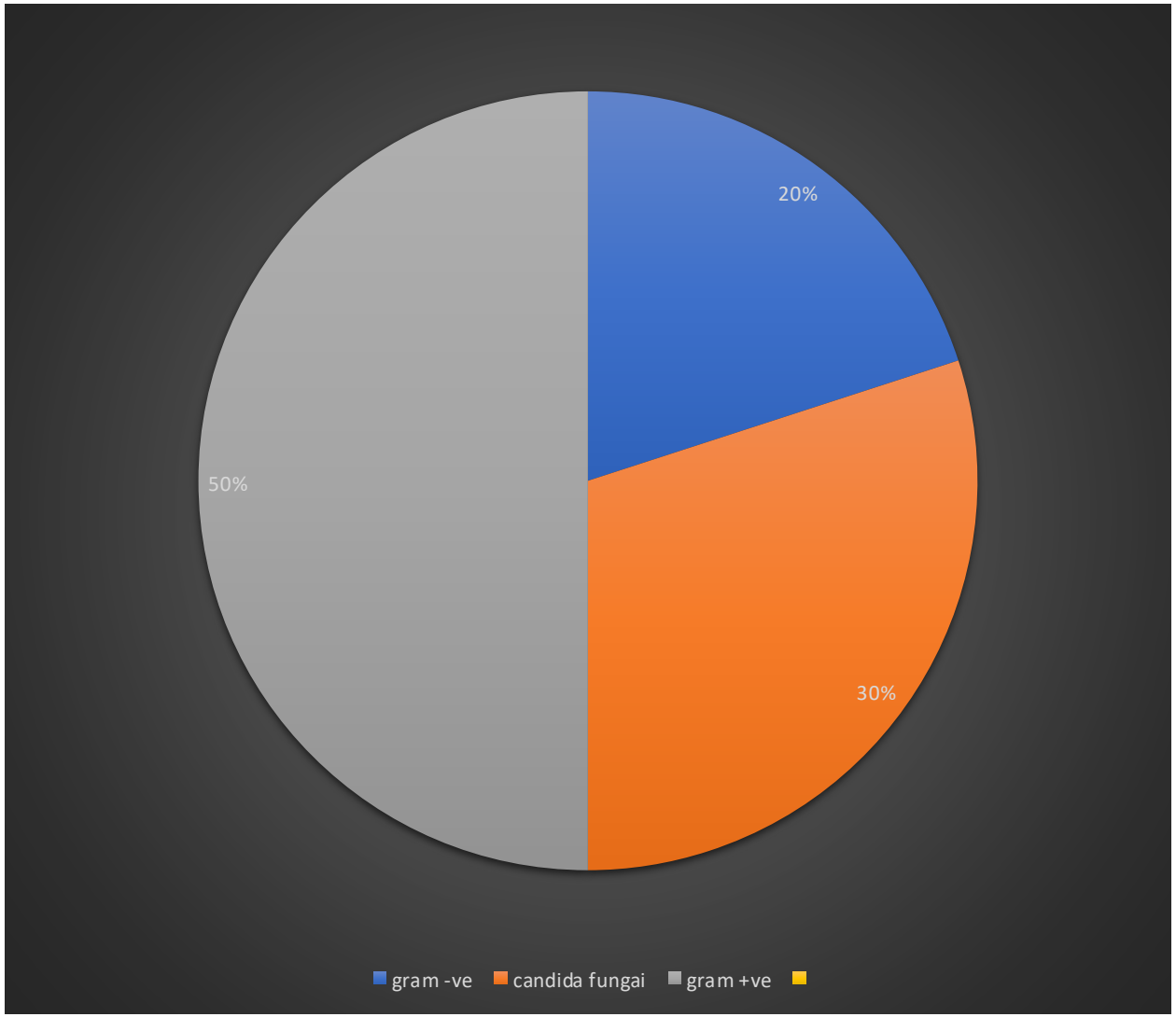
Hence, Oregano oil is used as antibiotic for gram (+ve) bacteria such as Bacillus subtilis, bacillus cereus. In gram (-ve) pseudomonas aeruginosa. In fungai (candida). Oregano oil has both antibacterial, antifungal, property due to the presence of abundant carvacrol and thymol component. It also used in aromatherapy and respiratory tract infection. Taking oregano oil supplements or rubbing it on skin may help a person make use of these antibacterial effect oregano oil are also potent anti-oxidant ,anti-inflammatory antidiabetic, and cancer suppressor agents.

First of all,I am greatful to The Alamighty Allah for establi shing me and to accomplish me this science fair project.
I wish to express my sincere thanks to Telangana science fair Academy for providing an opportunity to participate in 13 Regional virtual science and Engineering fair
It gives me immense pleasure to express my deep sense of thanks and gratitude Mr.Abdul Mannan sir, Director, and NOESIS JUNIOR COLLEGE. For providing me with all the necessary facilities to conduct this science fair project ., I am greatful to my mentor and guide to place her on record valuable guidance received from Ms.Ghafoor unnisa, her dedication and kneen interest to help her students had been solely and mainly responsible for accomplishing successfully and completing my science fair project .
I am greatful to Geetanjali Medical of Pharmacy for allowing me to perfom my experiment in their Microbiological laboratory which helped me to a great extent to accomplish this project.

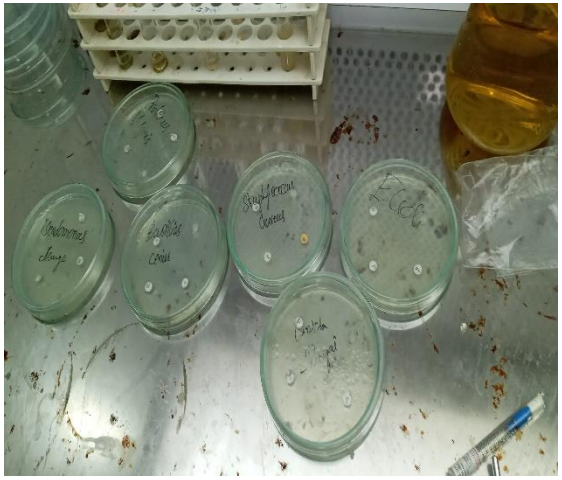
- Ben-arye E,et al.(2011). Reatment off upper respiratory tract infection. In primary care: A randomized study using aromatic herbs. DOL:10.115/2011/690346.
- Han F, et. (2017) chemical compision and antioxidant activities of essential oils from different parts of oregano DOL; 10.1631/jzus.B1600377.
- Magi G, et al. [2015] antimicrobial activity of essential oils and carvacrol, and erythromycin ,against clinical, erythromycin-resistance group A
- Streptococci.Dol:10.3389/fmicb.2015.00165.
- Mockute, Danute, Bernotiene, Genovaite,Judzentiene, Asta (2001). “The essential oil of origanum vulgare L.Ssp.Vulgare growing wild in vilnis district (Lithuania)”. Phytochemistry.57(1):65-9.doi:10.1016/S0031/9422(0000474-X.PMID11336262.

Gram (+ve) Bacteria	Sensitivity	Resistance	Gram (-ve) Bacteria	Sensitivity	Resistance	Fungal	Sensitivity	Resistance
Bacillus Subtilis	Ipm,CIP, Oregano	Penicillin	Escherichia Coli	PIT, Penicillin	CIP,IPM, Oregano	Candida Fungai	Oregano, IPM	Pencillin, CIP,PIT
Bacillus Cereus	Oregano, CIP	PIT, IPM	Pseudomo-nas, Aeruginosa	Penicillin, CIP	PIT,IPM, Oregano	-	-	-
Proteus Vulgaris	-	-	Staphylo-coccus aureus	Oregano, Pencillin	CIP,IPM, PIT	-	-	-

BACTERIA SHOWING SENSITIVITY TOWARDS OREGANO OIL





AI FARMER

Life Science

Senior Level

AI FARMER

SCIENCE FAIR PROJECT REPORT

Level	:	Senior level
CATEGORY	:	Life Science

Submitted by

BS.MOHAMMED SIDDIQUE

(Grade 12)

FATHIMA CENTRAL SENIOR SECONDARY SCHOOL

(SAIDAPET, CHENNAI)

CONTENTS

S.NO	TITLE	PAGE NO
1.	ABSTRACT	3
2.	INTRODUCTION	4
3.	STATEMENT OF THE PROBLEM	6
4.	HYPOTHESIS	7
5.	DESIGN OF THE STUDY	8
6.	COLLECTION OF DATA	16
7.	RESULT	20
8.	DISCUSSION	21
9.	APPLICATION	21
10.	CONCLUSION	22
11.	FUTURE ENHANCEMENT	23
12.	ACKNOWLEDGEMENT	24
13.	REFERENCES	25

ABSTRACT

Artificial intelligence farmer is being made to cultivate land and for garden, agriculture purposes. Where our machine is capable of doing everything a farmer does on his field more over in an efficient way.

Our machine can detect pest, insect and unwanted foreign organisms on our plant using an acoustic sensor (pest detection sensor).

Moreover we use our own organic liquid fertilizers which is obtained from herbivores animal wastes and excretes.

It has a lot more features like it consumes renewable energy from the specially modified solar panel.

The robot is made to consume less energy in an efficient way so nothing is wasted. Even the

usage of fertilizers water and extra are minimised because robot gives only what the plant needs.

INTRODUCTION

CAN A ROBOT DO FARMING?

CAN ORGANIC FERTILIZER AND PESTICIDES BE EFFECTIVE THAN THE CHEMICAL FERTILIZERS AND PESTICIDES?

This project is made in the intention to reduce the work load of the farmers who are facing a lot of difficulties in the farming moreover the waste of resources and materials are reduced to its minimum.

In the field of agriculture comer plantation begins with ploughing the land and sowing the seeds. The traditional method of ploughing is done by attached to an OX and tractors needs human involvement to carry the process. The driving force behind this work is to reduce the human interference in the field of agriculture and to make it cost effective.

This work, a sample of space is taken into consideration and the robot introduced localises the path and can navigate itself without human action. For ploughing, is robot is provided with plough design constructed by our self- attached with sample beams.

Our specially made organic liquid fertilizer helps in an efficient way to increase the plant growth and moreover organic pesticides are used to get rid of

the pests and other unwanted organisms and the nutrition value of plant is also increased.

STATEMENT OF THE PROBLEM

Nowadays farmers are facing a lot of problems due water scarcity. Water scarcity has a huge impact on food production. Without water people do not have a means of watering their crops and, therefore, to provide food for the fast growing population. According to the International Water Management Institute , agriculture, which accounts for about 70% of global water withdrawals, is constantly competing with domestic, industrial and environmental uses for a scarce water supply. In attempts to fix this ever growing problem, many have tried to form more effective methods of water management. So in order to make efficient water usage, we came up

with an idea of making a robotic farmer which could detect exactly how much water does the plant need and according to that the water is supplied from one of its tanks.

Moreover it could do many things like detecting pests and insects with the acoustic sensor. Could detect the moisture level and more, every aspect is controlled by a specially programmed raspberry pi and we get every information of the plant is displayed in our phone using IOT (INTERNET OF THINGS).

HYPOTHESIS

Is to make robot capable of doing everything which a modern day farmer could do. Moreover reducing the wastage of resources in large scale productions. This can also be a house garden. This robot can be modified according to the needs.

DESIGN OF THE STUDY

INDEPENDENT VARIABLE :

The man work is not used and altered by AI (artificial intelligence) and Chemical fertilizers and pesticides Are substituted with our Organic Fertilizers and pesticides.

DEPENDENT VARIABLE: yielding, time consumption, work Reduced, wastage of material and resources.

CONTROLLED VARIABLE :

Seeds are the same.

.

METHODOLOGY AND PROCEDURES

Ploughing the land and sowing seeds is the root of any plantation or cultivation. Farmer sowing seeds manually without any machinery is the tradition way. The next modification is the introduction of tractors. Tractors are used to plough land and sow seeds automatically. It reduces the effort to farmer Tractors replaced the work of OX in fields. The main problem of existing technology, it is costly and unable to be operated by the farmer. The robot discussed here can act as a better replacement of the above-mentioned

problems. The robot can also visualize its own path to cover entire farm

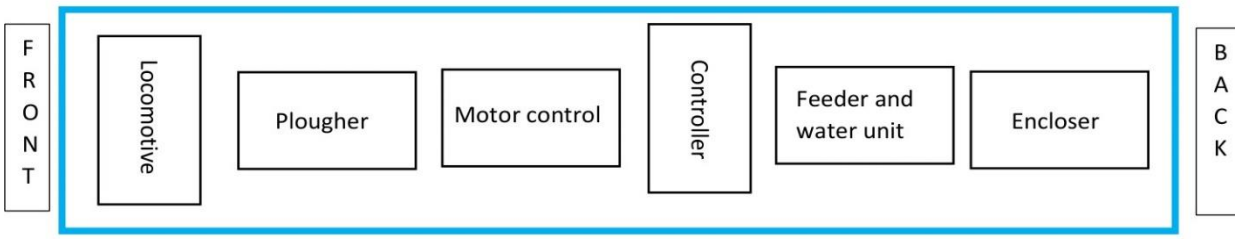
HERE ARE A FEW OF THE ROBOT'S SPECS:

- +30KW / 42HP peak power
- 1400 ft.lb torque
- 400W bi-facial, high-efficiency solar panel for 10KWh energy storage
- 50″(W)×80″(L) with zero turn
- Dual colour and depth (distance measuring) cameras, accelerometer, magnetic compass, and GPS
- 4G/3G/2G modem for self-update/telemetry publish/map downloads

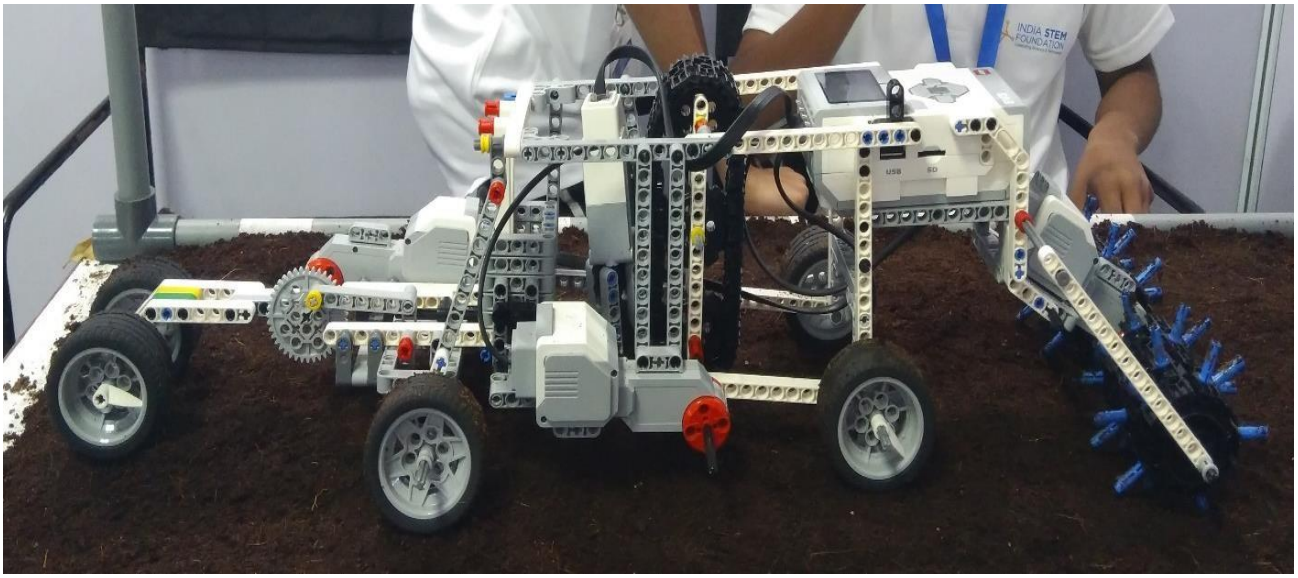
and Wi-Fi, allowing direct control from smartphone or PC

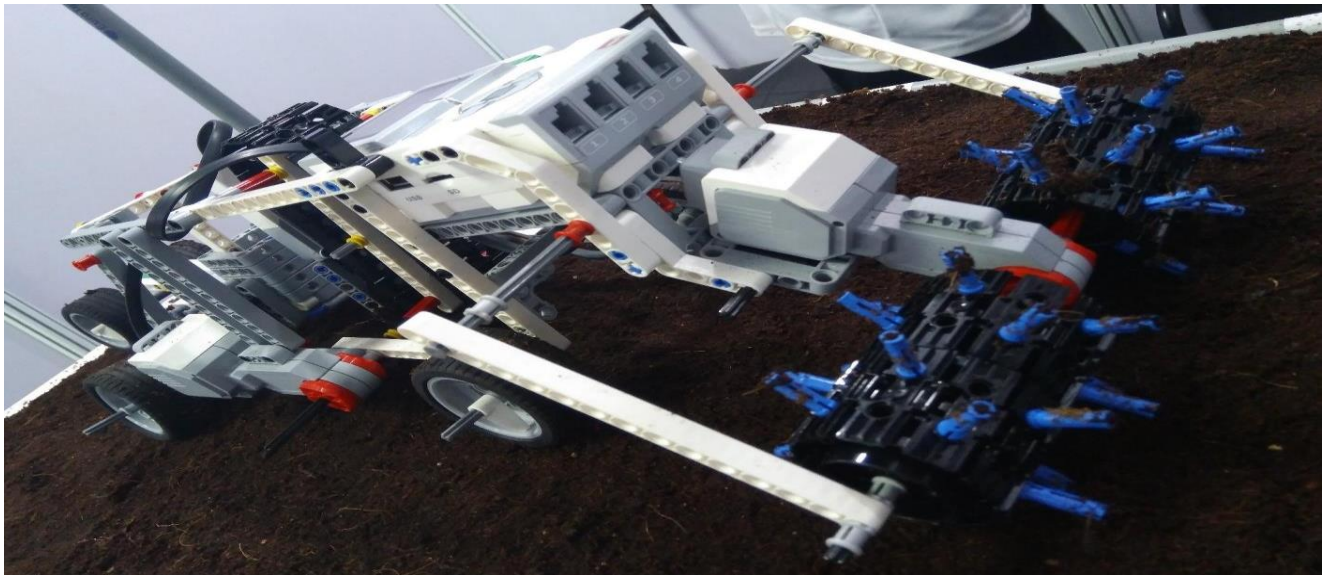
- Multiple autonomy modes, area coverage, and way-point navigation
- Follow mode, person or peer robot, using wearable tag, depth sensors and motion control using smartphone touch/tilt, combined with obstacle avoidance

Fig. ILLUSTRATION OF AI FARMER



PROTOTYPE MODEL PICTURE





PICTURE OF THE PLANT GROWN USING ORGANIC FERTILIZER

PROCEDURE OF MAKING THE ORGANIC FERTILIZER

Make a bin in ground. Compost bins are of two types, stationary and rotating. Both types must have their contents turned periodically to provide oxygen and combine the decaying materials. Stationary bins can be as simple as well-ventilated cage made from wire fence sections or wooden crates assembled from a kit. A well-designed bin will retain heat and moisture, allowing for quicker results. Then there's compost tumblers easy to turn bins that speed up the process — compost in weeks, not months or years — by frequent oxygen infusions and heat retention. Select one based on how much plant matter (animal waste, grass, leaves, weeds, stalks and stems from last year's garden) you have at your disposal, how large your yard is, and how

quickly you need to use the finished product. If you find that your pile or bin is too wet, turn it, adding plenty of shredded newspaper or fall leaves as you do. These "browns" will soak up some of the excess moisture. Refrain from adding greens for a while, until the pile returns to a normal moisture level. If rain has been an issue, cover the pile with a tarp during rainy weather. If you find that it's too dry, simply give it a spray with the hose or watering can. Likewise, you can make a bit of a "well" in the top of your pile and add water to that -- the water will step down into the pile and moisten the contents at the center. When using the stationary

COLLECTION OF DATA

TIME CONSUPTION OF PLOUGHING AND SOWING THE SEEDS of 50 square feet land

METHOD	TIME CONSUPTION
AI FARMER	10 minutes
TRADITIONAL METHOD	28 minutes

And the wastage of materials are reduced to its minimal.

GROWTH RATE OF PLANT:

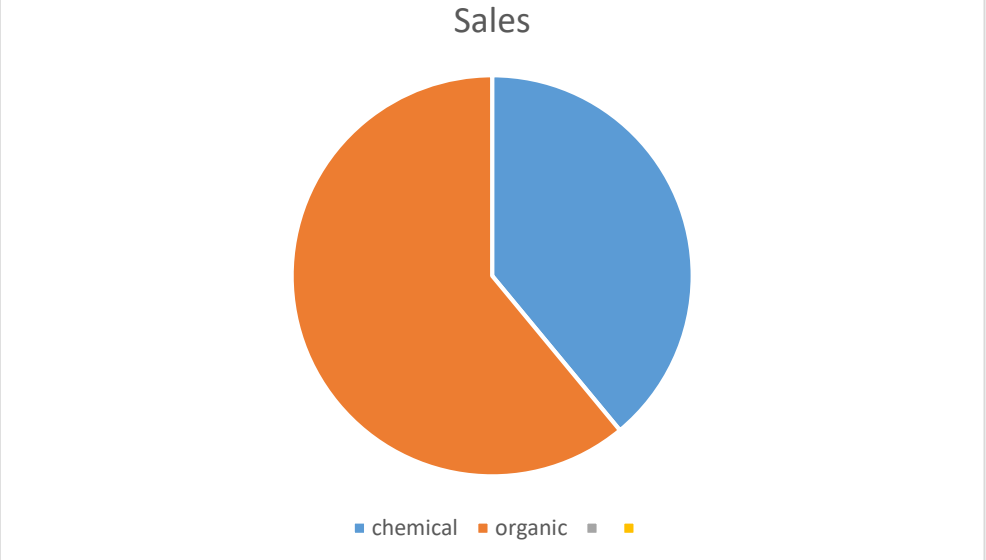
With organic fertilizer, pesticides and with chemical fertilizer, pesticides.

With help of a mustard seeds, they are fast growing plants.

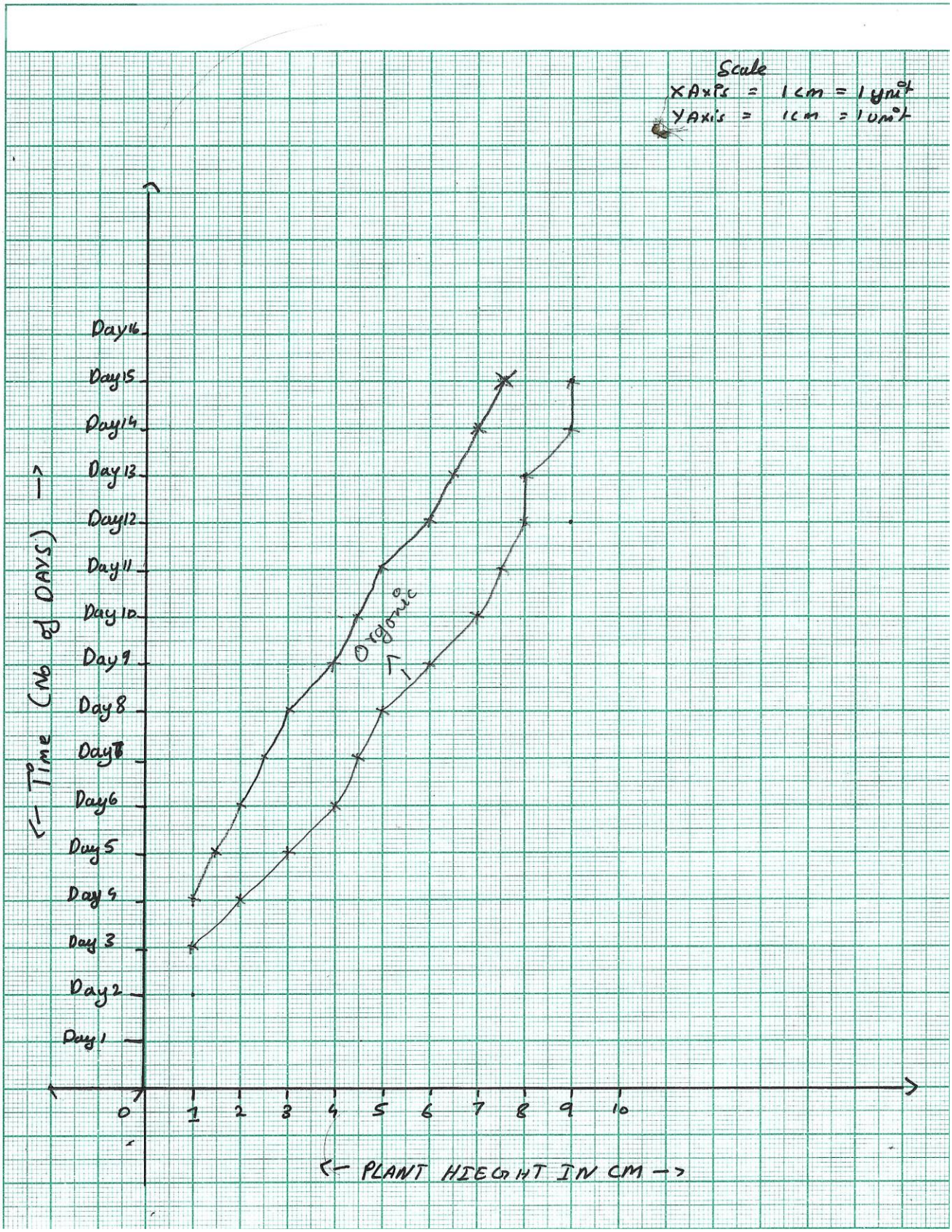
DAYS	ORGANIC	CHEMICAL
DAY 1	0 cm	0 cm
DAY 2	0 cm	0 cm
DAY 3	1 cm	0 cm
DAY 4	2 cm	1 cm
DAY 5	3 cm	1.5 cm
DAY 6	4 cm	2 cm
DAY 7	4.5 cm	2.5 cm
DAY 8	5 cm	3 cm
DAY 9	6 cm	4 cm
DAY 10	7 cm	4.5 cm
DAY 11	7.5 cm	5 cm
DAY 12	8 cm	6 cm
DAY 13	8 cm	6.5 cm

THE LAST DAY PICTURE

DAY 13



GRAPHICAL REPRESENTATION



RESULT

Therefore by analysing the data we can clearly see that both the robot and the organic fertilizer are efficiently working.

- ✓ As per the hypothesis the wastage of material were reduced and used efficiently.
- ✓ The activity were notified and controlled by RASBERRY PI in a phone application.
- ✓ The robot can be controlled using a smart phone very easily. Thus every farmer can use it.

DISCUSSION

As per the results of the project we could tell that is was a bit of success. This can be improved to higher level by finding and rectifying the minor mistakes in this project.

APPLICATION

The real-life model can cost up to 75,000 INR to 100,000 INR which is affordable than a tractor and more over the size of the robot can be compared to a mini tractor where it has its own charging dock, it charges itself when it’s time to .

There a lot of obstacles while making this robot, while preparing the circuit, while programing and so and so...

If this project comes under role in agriculture it’s going to be a turning point to the modern agriculture itself.

CONCLUSION

Our project according to the result will reduce the work load of the farmers.

It will be a solution to all kind of problems in agriculture.

Moreover it can be very easily implemented in the field in a terrace farming even in the small garden of our house because the robot is completely customisable according to ones need.

FUTURE ENHANCEMENT

As previously told the robot (AI FARMER) is completely customisable it can be easily enhanced according to the situations and needs of the people and places. It enhances the use of more renewable energy.

It could rise the production of food crops and which leads to increase in income of the farmer.

Thus improves the life style of the farmer and more will be interested in farming. This be enhanced more and more with the help of AI (**artificial intelligence**).

ACKNOWLEDGMENT

I would like to express my special thanks of gratitude to my guide teacher and a mentor “Mrs. Annie Ruth Heleena. D” For Her guidance and support in all aspects of completing my project, she gave an excellent solution for every problem we faced till the final.

I would also like to extend my gratitude to the principal “Dr.A.Nigar akthar” and vice principal “Mrs.A.Naaz parwar” of my school and the school management for providing me with all the facilities and help that was at most required.

THANK YOU…

REFERENCES:

https://www.agrifarming.in/organic-fertilizer-production-project-report-cost-profits

by Jagdish Reddy

Wikipedia

https://en.wikipedia.org/wiki/Organic_fertilizer

BOOKS:

Organic Fertilizers: Types, Production and Environmental Impact

Book by Rajeev Pratap Singh

AND

Organic Fertilizers: From Basic Concepts to Applied Outcomes

Book by Marcelo L. Larramendy and Sonia Soloneski

FOR ROBOTICS

1. Robotics and Mechatronics for Agriculture
2. Robotics and Automation for Improving Agriculture

AND OTHER REFERENCES FROM INTERNET