

**GOVT.DEGREE COLEGE FOR WOMEN,
HUSSAINIALAM, HYDRABAD**

DEPARTMENT OF BOTANY

STUDENT STUDY PROJECTS



Student study Projects.

2021 - 2022

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S.No.	Topic Name	Name & Rollno.	Mentor Name
1.	Identification of Medicinal plants & Health benefits. (study).	1. Sofia Sami. 108320445075. 2. Khaliya begum. 108320445029. 3. Sana begum 108320445062. 4. Sakha Khaloos. 108320445056. 5. Najma. 1083445041.	V. Sultas (V. Sunita)
2.	Estimation of chlorophyll Content in Monocot (Rice) & Dicot (Mustard).	1. Aitya Begum. 108321445016. 2. Afshaan Tabeen. 108320445006. 3. Afreen Bee 108320445005 4. Tahseen begum 108320445089. 5. Muskaan begum. 108320445039.	Dr. P. Latha
1.	Cassia Fistula.	1. Reshma (108320445048)	K. Vidyadhar (B2C) in sem.
2.	Anacardium occidentale. (CASHEW)	2. Taiyaba Tahseen (108320445090)	
3.	Mangifera indica (mango)	3. Maryam Begum (108320445032)	
3		4. Kashi-fa Na Jam (108320445028)	
		5. Samreen Begum (108320445034)	



GOVT. DEGREE COLLEGE FOR WOMEN
Hussainialam, Hyderabad



Student study project

NAME OF THE TOPIC

**IDENTIFICATION OF MEDICINAL PLANTS
&
THEIR HEALTH BENEFITS**

NAME OF THE STUDENTS:

- 1. KHATIJA BEGUM - 108320445029**
- 2. SANA BEGUM -108320445062**
- 3. SOFIA SAMI – 108320445075**
- 4. NAZMEEN SULTHANA -108320445043**
- 5. SYEDA AJMEEN-108320614004**

MENTOR NAME: V. SUNITHA

I. Objectives: To identify medicinal plants.

To assess and understand the health benefits.

To conservation of medicinal plants.

II. Methodology: Our students are assigned to trace medicinal plants at their residential localities .The students were given formats of data of number of medicinal with their names

List of medicinal plants identified

S.no	Name of the plant	Number
1	Aloe vera	20
2	Neem tree	5
3	Tulasi	30
4	Vinca rosea	50
5.	Moringa	5
6.	Ajwain plant	10
7	Pongamia pinnata	10

Health benefits of medicinal plants

S. No	Name of the plant	Health benefits
1	<u>Aloe vera</u>	Gum infection, Eye irritation and injuries
2	<u>Neem tree</u>	Reduce tooth plaque and to treat lice
3	<u>Tulasi</u>	Natural immunity booster, reduce fever
4	<u>Vinca rosea</u>	Used to treat diabetes, cancer fighter
5	<u>Moringa</u>	Rich in vitamin and minerals, protect the liver
6	<u>Ajwain plant</u>	Ajwain cures a cold, and ajwain helps in weight loss
7	<u>Pongamia pinnata</u>	Cleaning gums, teeth, ulcer, and also skin diseases



Result & Conclusions

The result indicates that our surrounding available common plants are highly medicinal valuable ones.

Number of plants are using in drugs preparations

Diversity in medicinal plants

Utilisation of these medicinal plants curing in various chronic health problems.

Hence this survey helps us to know about our plant wealth and it's an individual responsibility to protect and conserve for future generations which has more medicinal values.

GOVT. DEGREE COLLEGE FOR WOMEN
HUSSAINIALAM HYDERABAD

STUDENT STUDY PROJECT

TOPIC

ANACARDIUM OCCIDENTALE [CASHEW]
MEDICINAL AND OTHER USES

NAME OF THE STUDENTS

1. AFRINBEE-108320445005
2. SALEHAKHATOON-108320445056
3. UMEMA FATIMA-108320445094
4. HAJERAFATIMA SIDDIQUI- 108320445023

MENTOR NAME: K.VIDYADHARI, LECTURER IN BOTANY

ANACARDIUM OCCIDENTALE (CASHEW)



GENERAL INFORMATION:

Anacardium occidentale, the cashew is a much branched, evergreen shrub or small tree with a spreading crown that can grow up to 15 meters tall. It generally shows branching about 50-150cm from the ground. The crooked bole can be 20-40cm in diameter.

Originating in S. America, cashew is now one of the most commonly cultivated nut crops in the world & is widely grown in many tropical areas, especially India, Brazil & East Africa. The plant also has a wide range of other uses, including as a medicine & source of various commodities.

KNOWN HAZARDS:

The shell of the nut contains an acid juice that acts as a powerful vesicant. The active ingredient

Cashew



CLASSIFICATION

Kingdom: Plantae
Clade: Tracheophytes
Clade: Angiosperm
Clade: Eudicots
Order: Rosales
Family: Sapindales
Genus: *Anacardium*
Species: *A. occidentale*



AGROFORESTRY USES

Because it grows well on poor sandy soils & near the coast, it has sometimes planted for erosion control. It has been intercropped with cowpea, groundnuts & horsegram in India. In A.P. & Orissa in India, cashew & coconut constitute a popular crop combination.

OTHER USES

The fruits contain 45-47% oil which has high heat resistance. It is an excellent lubricant & is also used in Vanishes, links, turbine packing wax, insulating coatings etc.



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STUDENT STUDY PROJECT

Name of the topic

**EXTRACTION AND ESTIMATION OF CHLOROPHYLL
IN MONOCOT (RICE) AND DICOT (MUSTARD) PLANTS**

NAME OF THE STUDENTS:

- 1. Afreen bee- 108321445005**
- 2. Afshaan Jabeen-108321445006**
- 3. Atiya Begum – 108321445016**
- 4. Muskaan begum-108321445039**
- 5. Tahsheen begum-108321445089**

MENTOR NAME: Dr. P.Latha

Extraction and Estimation of Chlorophyll in monocot (Rice) and dicot (Mustard) plants

I. Introduction

Chlorophyll is a green pigment consists of tetrapyrrole ring with a central magnesium ion. It has a long hydrophobic phytol chain in its structure. It is found in some varieties of plants and algae (Aminot, 2000). Two types of chlorophyll, 'a' and 'b' are present in green algae and terrestrial plants. The difference between these two chlorophylls is a methyl moiety in chlorophyll 'a' replaced by a formyl group in chlorophyll 'b'. The ratio of chlorophyll 'a' to chlorophyll 'b' in higher plants is approximately 3:1. Chlorophyll absorbs light mainly in the red (650 – 700 nm) and the blue - violet (400 – 500 nm) regions of the visible spectrum. Green light (~550 nm) is not absorbed but reflected giving chlorophyll its characteristic color.

Chlorophyll 'a' possesses a green-blue color, and chlorophyll 'b' possesses a green-yellow color (Arnon, 1949).

Rice is the most important food crop of India covering about one-fourth of the total cropped area and providing food to about half of the Indian population. *Oryza sativa*, rice, is a genus of perennial grass in the Poaceae (grass family) that originated in India. This is the staple food of the people living in the eastern and the southern parts of the country, particularly in the areas having over 150 cm annual rainfall. The health benefits of rice include its ability to provide fast and instant energy, regulate and improve bowel movements, stabilize blood sugar levels and slow down the aging process, while also providing essential source of vitamin B1 to the human body. Other benefits include its ability to boost skin health, increase the metabolism aid in digestion, reduce high blood pressure, help weight loss efforts, improve the immune system and provide protection against dysentery, cancer, and heart disease.

Rice (monocot) is staple food of the people and is extensively cultivated in irrigated lands in every villages in Khariff and Rabi Seasons.

The Mustard (*Brassica juncea*) belongs to cruciferous vegetable family. The Mustards are annual or biennial herbs that can grow from 1 to 3 meters in height. In general, its young tender green leaves, which used as green-leafy vegetables are gathered when the plant reaches about 2 feet tall. If left alone, it continues to grow, reaches about 4-5 feet in height and bears golden yellow flowers which subsequently develop into Mustard seed pods. Finally, the dried, ripe seed is used commercially. The Mustard plant contains large amount of beta carotene and vitamin C that are very important antioxidants. This vegetable plant seems to have cancer preventive properties similar to Broccoli, Cabbage and Kale. The Mustard plant also contains Calcium that can be useful to lactose intolerant individual. The Mustard green also contains significant amount of Iron, which can be useful in correcting iron deficient health problems.

I) Chlorophyll and Its Chemistry

Chlorophyll is essential for photosynthesis. It serves two primary functions i.e., to 1) absorb light and 2) transfer that light into energy. There are more than one type of chlorophyll, each type plays a different role and has a unique chemical structure. But, mainly two types of Chlorophylls, they are Chlorophylls 'a' and 'b'.

i) Chlorophyll 'a'

Chlorophyll 'a' is a large molecule that has a porphyrin ring with a magnesium atom at its center. The porphyrin is a long, insoluble carbon-hydrogen chain which interacts with the proteins of the thylakoids and serves to anchor the molecule in the internal membranes of the chloroplast. Chlorophyll 'a' is the pigment that interacts directly in the light requiring reactions of photosynthesis.

Chemical Formula is: $C_{55}H_{77}O_5N_4Mg$

Molecular weight: 873

ii) Chlorophyll 'b'

Chlorophyll 'b' is different from Chlorophyll 'a' in only one of the functional groups bonded to the porphyrin. It is an accessory pigment and acts indirectly in photosynthesis by transferring light to Chlorophyll 'a' for absorption.

Chemical Formula is: $C_{55}H_{70}O_6N_4Mg$

Molecular weight: 907

Alternating single and double bonds or conjugated bonds, like the porphyrin ring of chlorophylls, are common among pigments and are responsible for the absorption of visible light by these substances. Both Chl-a and Chl-b primarily absorb red and blue light, the most effective colors in photosynthesis. They reflect or transmit green light, which is why leaves appear green.

II. Materials and Methods

The Plants were grown under natural day length of Hyderabad town. The mustard seeds and rice were sown in clay pots (40×50 cm in diameter 40×70cm in height) containing fresh sieved black soil is uniformly mixed with vermin-compost in the ratio of 10:1 ratio per Pot to make the soil fertile. Three pots for each plant (mustard and rice) were used for growing. The fresh leaves were used for chlorophyll estimation on 45th day.

i) Extraction and Estimation of chlorophyll pigments:

Concentration of chlorophyll a and b was calculated using Arnon method. Arnon (1949) method was adopted for estimation of chlorophyll pigments. Leaves of mustard, oryza sativa were washed with distilled water and dried. Take 200mg of leaf material and macerated in 2ml of 80% acetone and separate the extract using mechanical centrifuge repeat the procedure for 3-4 times with same material until till white pellet was obtained. Make up the extract for 25ml with 80% acetone. Quantitative analysis was done by spectrophotometrical method. Optical density (O.D.) values are measured by

using Systronics 106 Automat instrument at λ_{\max} of 663nm, 645nm & 480nm for calculating the chl-a and chl-b pigments.

ii) Calculations formule used:

a) Chlorophyll 'a' ($\mu\text{g}\cdot\text{g}^{-1}$ f.w.)

$$((\text{O.D.663}\cdot 12.7)-(\text{O.D.645}\cdot 2.69))\cdot V/1000\cdot W$$

b) Chlorophyll 'b' ($\mu\text{g}\cdot\text{g}^{-1}$ f.w.)

$$((\text{O.D.645}\cdot 22.9)-(\text{O.D.663}\cdot 4.68))\cdot V/1000\cdot W$$

c) Total Chlorophyll ($\mu\text{g}\cdot\text{g}^{-1}$ f.w.)

$$((\text{O.D.645}\cdot 20.2)-(\text{O.D.663}\cdot 8.02))\cdot V/1000\cdot W$$

(Note: f.w.: Fresh Weight) .

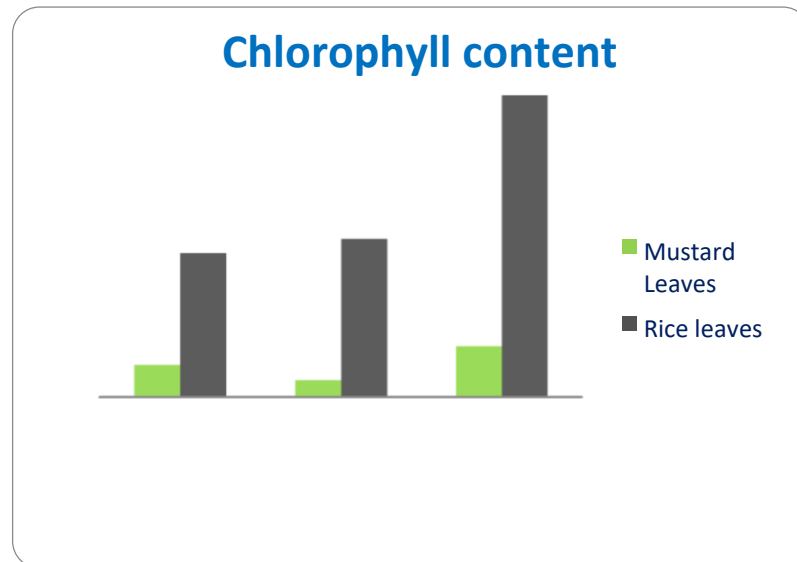
III. Results and Discussion:

In this study rice and mustard plant leaves were used to estimate the chlorophyll content. Chlorophyll estimation was done in the fresh green leaf samples extracted with the acetone solvent the absorbancy readings of chlorophyll extracts were measured in two different wavelengths 645nm and 663nm respectively. Based on the absorbancy value calculations were made using Arnon's (1949) equations as mentioned above. The amount of chlorophyll a, chlorophyll b and total chlorophyll were estimated for rice and mustard plants were tabulated below.

Estimation of Chlorophyll content in Mustard and Rice

Name of the plant	chlorophyll a ($\mu\text{g}\cdot\text{g}^{-1}$ f.w.)	chlorophyll b ($\mu\text{g}\cdot\text{g}^{-1}$ f.w.)	total chlorophyll ($\mu\text{g}\cdot\text{g}^{-1}$ f.w.)
Mustard Leaves (Dicot Plant)	20.84 \pm 1.45	10.90 \pm 1.88	33.02 \pm 2.16
Rice leaves (Monocot Plants)	93.64 \pm 0.042	102.89 \pm 0.237	196.47 \pm 0.245

The values are mean +S.E(n=3)



Bar graphs of Chlorophyll content in rice and mustard

Chlorophyll content in Rice leaves observed higher than Mustard because monocots have Kranz anatomy structure (the special structure of leaves in C₄ Plants (Rice), where the tissue equivalent to the spongy mesophyll cells is clustered in a ring around the leaf veins, outside the bundle-sheath cells. Kranz anatomy structure are absent in dicots, so the highest total chlorophyll content (a + b) was detected in rice ($196.47 \pm 0.245 \mu\text{g/ml}$) than mustard plant ($33.02 \pm 2.16 \mu\text{g/ml}$).

IV. Conclusion

Different levels of Chlorophyll contents were observed in rice and mustard plants. In the present study chlorophyll a (Chl. a) and b (Chl. b) content of two different plants (Monocot and dicot) have been recorded. The qualitative difference of chlorophyll a (Chl.a) and b (Chl.b) content between monocot and dicot plant leaves were observed. A total of two plant species were selected namely Mustard (Dicot), Rice (Monocot) and were used for analysis of chlorophyll content. In all the cases the Monocot leaves showed higher chlorophyll content in comparison to Dicot leaves. This has been proved that the age of leaves was an important factor for chlorophyll content. The relationship between chlorophyll content in monocots was significantly different from that in dicots. Chlorophyll content in Rice (monocot) leaves observed higher than Mustard (dicot) by ratio 6:1 because monocots have Kranz anatomy structure.

References:

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