R. K. GROUP OF COLLEGE

BEHIND KALWAR POLICE STATION, KALWAR, JAIPUR (RAJ.)

BOTANY

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Economic

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Wheat

common Name - Gehun or Gehoon or Kanak
BOTANICAL NAME - Triticum aestivum L.
FAMILY - Graminal or Poaceal.
USEFUL PART - Caryopsis

1. It is one of the most important cereal crop of the family Poaceae.
2. The important types of wheat are - Einkorn, emmer.
3. Wheat plant is an annual grass having heigh 2-5 ft.
4. Its stem is known as Culm which is vertical erect and upright, differentiated into nodes and internodes.
5. Roots are fibrous and advertitious.
6. The spikes or ears are developed after the vegetative growth of plant is completed, this process is known as shooting or booting
7. The grains are produced in an inflorescence, which is as we known, spike of spikelets, A mature grain consists of embryo starchy endosperm prokinaceous aleurone layer and husk.

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MAIZE

LOCAL NAME- makka or makai
BOTANICAL NAME- zea mays L.
FAMILY - Graminae or Poaceae.
USEFUL PART- Caryopsis.

1. It is an annual cereal grass, attaining a height of 3 to 15 feet. Its plant body is largest amongst cereals.
2. The stem is jointed and usually solitary because of sparse tillering.
3. Flower are of two types i.e, terminal tassel bearing the male or pistillate.
4. Cob is covered by large number of leafy bracts. Known as spathe or husk.
5. Each sessile female flower consiste of lemma, palea and carpeal Long style is exerted out of spathe. these styles are collectively known as silk.
6. The fruits are single seeded, caryopsis
7. A protein named zein is present in maize, it is used in making artificial fibres.

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RICE

LOCAL NAME - Chawal or Dhan
BOTANICAL NAME - Oryza Sativa
FAMILY - Graminae or Poaceae
USEFUL PART - Caryopsis

1. Rice plant is a semi-aquatic annual grass having average height of 2-5 cms.
2. Stem is cylindrical and differentiated into nodes and internodes. and plant becomes somewhat tufted or bunchy because of tillering from the base.
3. Inflorescence is panicle of spikelets, spikelets are solitary and single flowered, Flowers are usually Self-pollinated, flowers surrounded by lemma and palea.
4. Lemma and palea collectively form hull which is jointed or united by grain, Rice grain + hull is also known as Paddy.
5. Fruit or grain is single seeded caryopsis The grain are of different shapes, Size and white or cream or red coloured.
6. Embryo is situated near the ventral side of basalend.

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GINGER

LOACAL NAME- Adark
BOTANICAL NAME- Zingiber officinale
FAMILY - zingiberdceae
USEFUL PART- Rhizome.

1- The plant is perennial herb with basal underground rhizome and erect aerial leafy.
2- Aerial branches are 2-3 feet long and densely foliated with terminal spike inflorence.
3. Rhizome is palmately branched and differentiated into node and internodes. At the nodes scaly leaves and fibrous adventitious root are present.
4. Rhizome is useful part of the plant.
5. Ginger is used vegetable, soup, pickles etc.
6. Ginger oil is used as medicine in cough of digestive disorders.
7. Ginger oil is also used in bakery, tooth paste and cosmetic.
8. Ginger wine and ginger beer is also prepared from ginger rhizome.

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TURMERIC

LOCAL NANE - Haldi
BOTANICAL NANE - Curcuma longa
FAMILY - Zingiberaceae
USEFUL PART - Rhizome.

1. Plant is a perennial herb. The plant is divided into a rhizome and reduced stem which have dense tuft of leaves on the top.
2. The main rhizome gives may cylindrical primary, secondary and tertiary branches. The surface of rhizome is rough, hard and posses annular ridges.
3. Rhizome contains Protein, Fat, cellulose, Volatile oils, resin and pigment.
4. It contains a Ketonic dye curcumine which is responsible for yellow colour.
5. Turmeric powder is prepared by grinding dry rhizomes, which is used as condiment in pickels, Vegetables etc.
6. Turmeric powder have the properties like blood Purifier and antibiotic. It is also used as natural dye.

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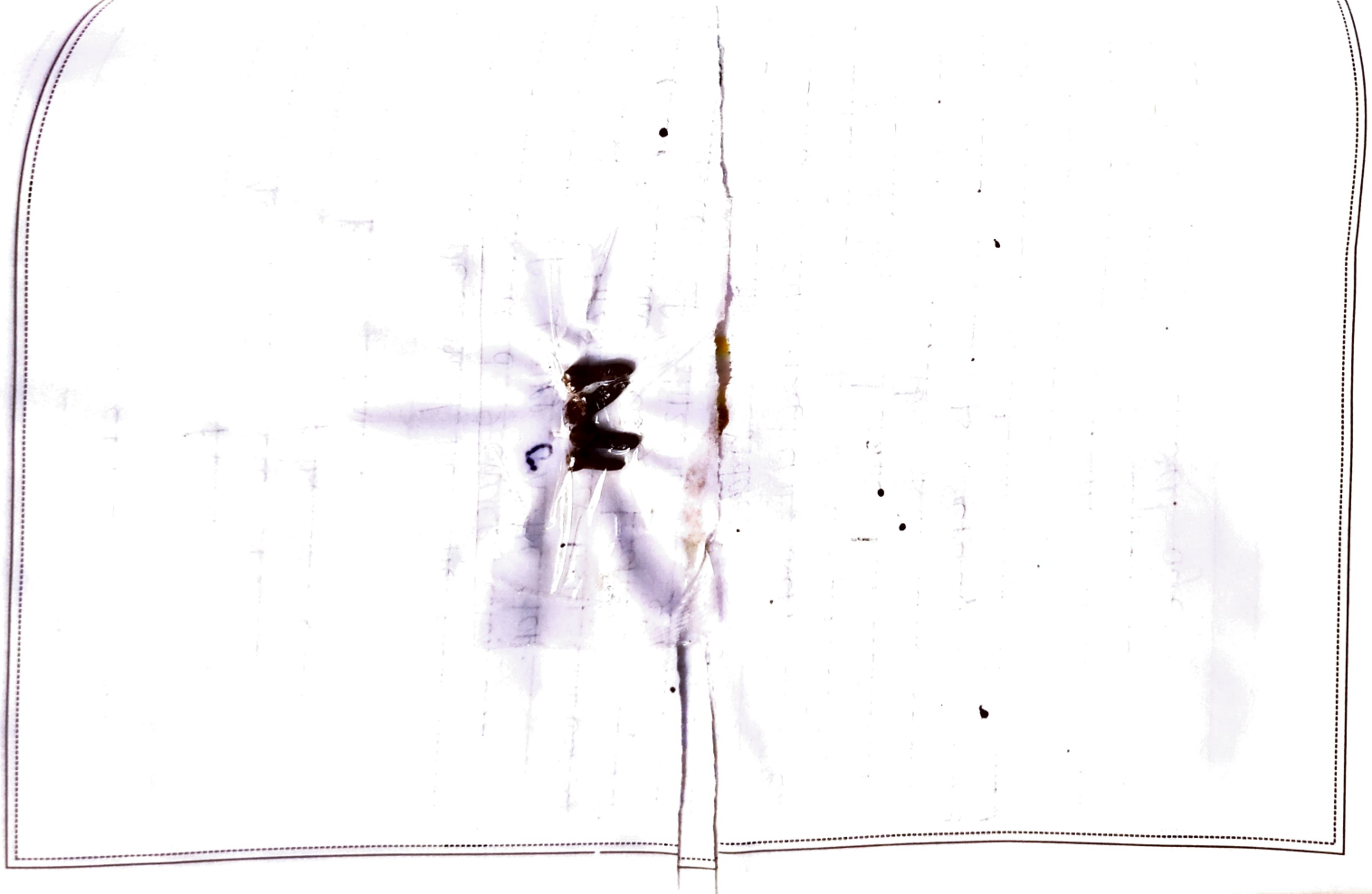

CLOVE

LOCAL NAME - Lang Lavang
BOTANICAL NAME - Syzygium aromaticum
FAMILY - Myrtaceae
USEFUL PART - floral bud

1. The clove plant is an evergreen, tree with an average height at 25-40 ft.
2. Leaves are simple, bright green coloured and aromatic blooming. After this they are dried in sunshine, as a clove
3. Green coloured floral buds are placed before their blooming. After this they are dried in sunshine, as a result of which these turn into dark brown colour.
4. It is the main component of Garam masala.
5. "clove oil" is obtained by its distillation which is used for the treatment of toothache.
6. clove is also chewed with betle leaf which have stimulating effect due to presence of eugeno-oil in it.
7. "Eugenol" may be obtained from all parts of Plants.

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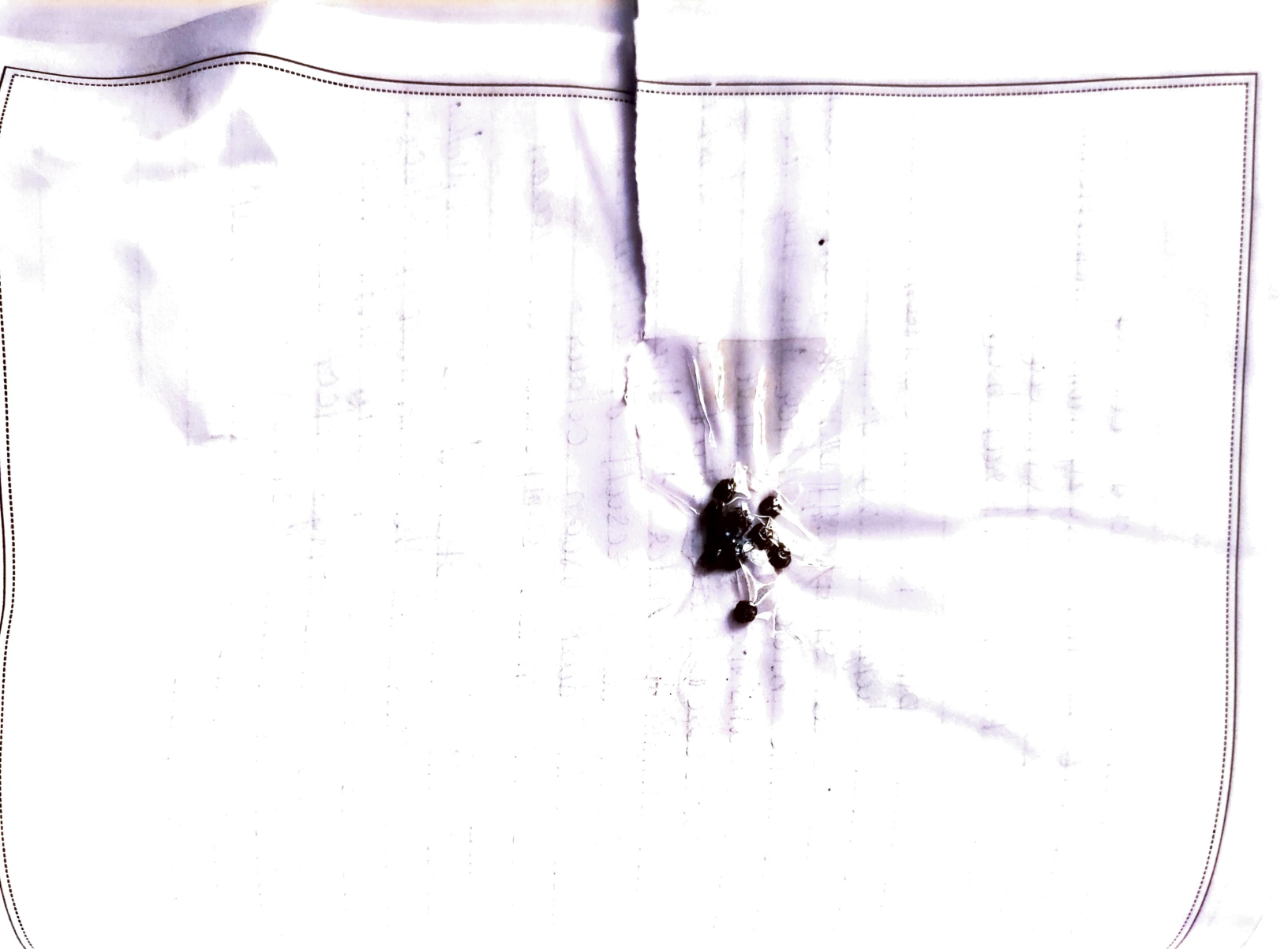

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BLACK PEPPER

LOCAL NANE - kali mirch
BOTANICAL NAME - piper nigrum L.
FAMILY - piperacea.
USEFUL PART - fruit.

1. Black Pepper is also termed as "king of species."
2. Its plant is slender and weak perennial climber and about a meters in length.
3. Stem is differentiated into nodes and internodes Leaves are simple, ovate and with acute apex.
4. It stimulates the secretion of saliva and digestive juices.
5. The black pepper seeds are stimulant and carminative.
6. Along with basil and sugar, its decoction is prepared which is used in the treatment of fever cold and cough.
7. 'Pepper oil' is obtained from the distillation of black pepper seeds, which is used in preparation of various medicines and tooth paste.

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CARDMOM

LOCAL NAME- chhoti elaichi or elaichi
BOTANICAL NAME- Elettaria Cardamomum
FAMILY - Zingiberaceae
USEFUL PART- fruit & seeds

1. chhoti elaichi is a native plant of India.
2. It is also known as 'queen of spices'.
3. cardamom is perennial, tall and shrub like herbaceous plant, with basal, underground rhizome.
4. Aerial branches are two types -(1) Vegetative and (2) fertile shoots.
5. The seeds in each locules are pressed together usualy separating in a single mass.
6. The seeds of cardmum are used as spice.
7. It is an important component of 'Garam masala".
8. It is also a popular mastic adorey used alone or with betle leaf.
9. As a medicine it is used as stimulant and carminative.

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ASHVAGANDHA

LOCAL NAME: Asgandh or Ashvagandha
BOTANICAL NAME - withania somnifera
FAMILY - Solanaceae
USEFUL PART - Root

1. plant is erect, branched and under shrub
2. The flower are arranged in axillary cyme. fruit are small powder or liquid
3. The drug is extracted from the roots, in the folem of powder or liquid.
4. The root contain alkaloids like - somniferine, Somniferinine and withanine etc.
5. Ashvagandha has narotic and Vigour.
6. It promotes strength and Vigour.
7. stem and roots bark paste is applied locally on wounds and boils; as it has got antibacterial and antibiotic properties

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TULSI

LOCAL NAME- Tulsi
BOTANICAL NAME- ocimum Sanctum
FAMILY - Labiatae or Laniaceae
USEFUL PART - Leaves & Seeds

1. It is an annual herb or under shurb, with the quadrangular stem and single leaves with opposite arrangement.
2. An injusion of its leaves in hot water or decoction along with tea specially is used for the treatment of cold, genral fevers is applied on ringworm.
3. paste of it fresh leaves applied on ringworm
4. powdered seeds with cool water are used in urinary disorder.
5. The powdered of leaves is also used as component of snuff.
6. Volatile oil present in its leaves has got antibacterial properties

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NEEM

LOCAL NAME - Neem
BOTANICAL NAME - Azadirachta indica
FAMILY - Meliaceae
USEFUL PART - Leav

1. It is a medium-sized deciduous tree.
2. A dry bark colocured barke is present over the stem which secrete the gum.
3. Flowers small, white and in panicle, fruit oval single seeded drupe on ripening fruit are sweet and called 'Nimboli'
4. An insecticide alkolide azodirachtin is obtained from different parts of the plant.
5. The gum which is secreted from bark is used as stimulant in medicines.
6. Sap emudation from Neem tree is collected and used as tonic.
7. A tonic is also prepared from its bark which is given as blood purifier.

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TEA

LOCAL NAME - cha - chai
BOTANICAL NAME - Camellia Sinesis
FAMILY - Theaceae or Ternstroemiaceae
USEFUL - young leaves and apical bud

1- The plant is an evergreen woody shrub having a leaves and.
2. The commerical tea consists of processed tender leaves and the leaf buds of plant.
3- Flowers are borne in leaf axil either singly or in group of two to four fruit are three called capsule.
4. The characteristic fragrance and aroma of the leave is due to presence of numerous oil glands in them.
5- Thiole is responsible for aroma while polyphenol is responsible for f.
6. For the preparation of green tea the leaves are steamed and dried without fermenting, which for black tea leaves are withered, rolled, fermented and dried

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COFFE

LOCAL NAME- Kafi, coffee
BOTANICAL NAME- coffea arabica
FAMILY - Rubiaceal
USEFUL PART- Seed

1- coffee plant is an ornamental shrub or small tree. The plant is usually kept bush like by pruning.
2- Stem is erect, woody and branched.
3- Young or immature fruits are green colored beries which become crimson-red coloured after ripening. These are also known as cherries.
4- Outer dark red coloured pericarp of ripened fruit or coffee cherry is known
5- Two seeds or coffee beans are present inside endocarp
6- Coffee beans are roasted for developing the aroma flavour and colour and ultimately grinded before reaching the customer.
7- Beans. Contain caffeine a volatile oil, glucose dextrins, proteins and fatty oil.

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COTTON

LOCAL NAME- Kapas, Rui
BOTANICAL NAME- Gossypium spp
FAMILY - Malvaceae
USEFUL PART - seed and seed coat hair

1. cotton is most significant fibre of the world
2. cotton plants are shrubby, herbaceous and dome-shaped. Its wild species are perennial but commercial species are annual in their habit.
3. Main Stem is erect, with monopodial branching.
4. Leaves are of large size, long petioled, and stipulate.
5. The content of each leave or division is called a "lock" in which 6-9 seeds are present.
6. Hairs are of two types - long hair or lint, glass or staple and short hairs or fuzz or linter.
7. The cotton fibres represent epidermal prolongations of seeds coat cells.
8. Seeds cake or "Khali" is used as cattle feed and fertilizer.

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JUTE

LOCAL NAME - pat or Tilpat
BOTANICAL NAME - corchorus capsularis
FAMILY - Tiliaceae
USEFUL PART - phloem fibres

1. The plant is woody and less branched annual shrub.
2. Jute plant is best grown in humid regions with moderate rains, and on ligit, sandy delicate and loamy soil.
3. The fibres are obtained from the secondary phloem by retting the sten. these are bast fibres.
4. Jute fibres are obtained from the Secondary phloem by retting the stem, these are bast fibres.
5. Jute fibre is used in making carpets, coarses material, twine, gunny bags etc.
6. From the fibres of jute sticks, high quality grease paper is prepared; which is commonly used in confectionary industry for wrapping greasy material.

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GROUNDNUT

LOCAL NAME - Moongphali
BOTANICAL NAME - Arachis
FAMILY - Legumionsace or Fabaceae
USEFUL PART - Seed

1. Groundnut plant is a creepening, bushy annual, with a teight of 30-60 cms.
2. Flowers are typically papilionaceous type to the
3. Soil due to formation of a positively geotropi stipe or peg or gynophose.
4. The fruit is an elongated or oblong indehiscent legume or pod having 1 to 3 seeds.
5. The embryo has a large radicle a leafy plumu and two fleshy white and massive.
6. Its hydrogeated oil yields 'vegetable ghee'.
7. Ardil, a synthetic fibre is manufactured from the proteins present in groundnut.

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MUSTARD

LOCAL NAME - Sarson, Pili Sarson.
BOTANICAL NAME - Brassica Spp.
FAMILY - Brassicaceae
USEFUL PART - Seed.

1. mustard plant is an erect, branched and annual herb, attaining a height of 3-5 feet normally.
2. leaves are simple alternately arranged with dissected margins, numerous multicellular hairs present
3. Flowers are arranged in corymode racemose inflorescence
4. The seeds may be mucilaginous or non-mucilaginous
5. mustard oil is widely used for cooking.
6. Oil is also used in lamps and in the manufacture of soap and rubber substitutes.
7. leaves of young plant are cooked as a vegetable.
8. Pungent or repellant smell is due to essential oil is widely used for cook. of sulphur compounds at the time of crop ripening.

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COCONUT

LOCAL NAME - Nariyal
BOTANICAL NAME - Cocos nucifera
FAMILY - Palmae or Arecaceae
USEFUL PART - Endosperm and pericarp

(1.) The plant of coconut is large and unbranched trees.
(2.) Flowers are developed in spadix inflorescence.
(3.) Numerous male flowers are developed on the terminal end of spadix, while 15-20 female flowers originate in it's basal part.
(4.) Maturation of fruits is completed in 9-12 months.
(5.) Completely matured fruits are used for extraction of coconut oil.
(6.) Coconut oil is used for edible purpose.
(7.) Endosperm is eaten raw.
(8.) In liquid endosperm various growth harmones are present, hence it is used for "culture media".

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PARA - RUBBER (HEVEA)

LOCAL NAME - Rubber tree
BOTANICAL NAME - Hevea brassiliensis
FAMILY - Euphorbiaceae
USEFUL PART - latex

1. It is a long, branched and fast growing trees generally grows in wild state.
2. Branches form a unical canopy.
3. Leaves are alternately arranged and trifoliate, pinnately compound and green coloured.
4. Flowers are small, green colored and fragrant which are arranged in axillary panicles. Flowers are unisexual.
5. Fruit is tricoccus capsule. Each locule consists of one seed.
6. Here a plant is propagated either by seeds or bud propagation.
7. Rubber is most useful in the insulation of electric wires.

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HISTOCHEMICAL

&

MICROCHEMICAL

TESTS

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EXPERIMENT - 1

OBJECT - To test the presence of protein by histochemical test

MATERIALS REQUIRED -

1. Acid fushsin reagent
2. Bromophenol reagent
3. formalin
4. Soaked pea seeds
5. Razor, slide, droppes, brush, coverslips etc.
6. Microscope

PROCEDURE

S.No.	Experiment	observation	Inferences
1.	METHOD: 1 (ACID Fuchsin METHOD): This section pea seeds + Acid fuchsin reagent + dinse with glycerine on slide	cell turns red	protein is present.
2.	METHOD: 2 (BROMOPHENOL BLUE METHOD): Thin section seeds + formalin + Rinse in wastes +		

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Bromophenol blue reagent + wash in 2% acetic acid + transfer to butyl alcohol + glycerine	Turns into dark blue	protein is present in tissue

RESULT →

The cell in the Acid Fuchsin method turns red which indicate the presence of protein.

(2) The cell in the Bromophenol blue method turns into dark blue that indicates the presence of protein in tissue.

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EXPERIMENT – 2

OBJECT :- To test the presence of tannis histochemically

MATERIALS REQUIRED:

1. Bark of Casuarina or Ziziphus plant
2. DMD Reagent
3. Formalin, ferric chloride Solutions.
4. Razor, Slide, coverslips, watch glass, glycerine etc.
5. Microscope

PROCEDURE:

S.No.	Experiment	Observation	Inference
	METHOD-1		
1	piece of bark + DMD reagent Stain + mount in drop of DMD + Observe	Turns into purplish-red	presence of tannis
	METHOD-2		
2	piece of bark + 10% formalin and 2% ferric chloride Solution for staining + mount it + observe	Turns into blue-green Colour	presence of Tannis

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RESULT:

1. The section stained in DMD turns purplish - red indicating the presence of tannis.

2. The section stained in ferric chloride turns blue - green colour which show presence of tannis.

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EXPERIMENT - 3

OBJECT -

To detect the presence of cellulose in the cotton fibers or paper.

MATERIALS REQUIRED -

1. Cotton or cotton fibers : papes
2. Conc. H_2SO_4 (Conc.) ; Iodine Solution
3. Slide, Coverslips, droppes, Spirit lamp etc.
4. Microscope.

PROCEDURE :-

S.No	EXPERIMENTS	OBSERVATION	INFERENCE
1.	Piece of cotton + drop of water + drop of iodine solution + stain 3-4 min. + observe	Brown in colour	
2.	Above mixture + drop of H_2SO_4 on it + wash	Colour changes again. Blue colour appear	presence of cellulose

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RESULT:-

The fibre turn into blue colour. Blue colour of fibre show the presence of cellulose. The blue colour appears because cellulose dissolve in H_2SO_4 and precipitates in form of any amyloid on dilution.

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EXPERIMENT - 4

OBJECT :- To detect the presence of lignin Jute fiber or match sticks.

MATERIALS REQUIRED.

1. Jute fibres / match sticks.
2. phloroglucin, Hydrochloric acid, Potassium Permagnate, ammonium hydroxide or sodium bicarbonate.
3. slide, coverslip, dropper etc.
4. Microscope.

PROCEDURE:-

S.No	EXPERIMENT	observation	Inference
	METHOD - I		
1.	Thin torn jute + place in 1% phloroglucint cover slip + drops of 25% HCl + observe	Red-violet colour appears	Obsed by lignified walls
	METHOD - II		
2.	Thin torn jute fibers + of 1% MnO_4 solutions keep 15-20 min + wash with 2% HCl +		

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EXPERIMENT	OBSERVATION	INFERENCE
wash with water + drop of NaOH or Na_2CO_3 & observe	Deep red Colour appear	lignified element of jute fibre

RESULT

1. In the first method red-violet colour is taken by lignified walls.
2. In the second method deep-red colour develop in the lignified elements

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EXPERIMENT - 5

OBJECT:-

To test the presence of lipid in plant tissue histochemically.

MATERIALS REQUIRED:-

1. Seeds of castor, almond and ground nut. fresh rind of orange fruit.
2. Razor, dropper, brush, Slide, Cover slip etc.
3. Glycerine, sudan - III solution, 50% alcohol 1% osmic acid,
4. Microscope

PROCEDURE.

EXPERIMENTS	observation	Inference
1. Thin section of seed take section 1-2 drop of sudan -III for 5min + wash with 50% alcohol + mount with glycerine and observe	oil drop present Red colour appear	oil drop
2. Add few drop of osmic acid section.	Turns into black colour	lipid Present

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RESULT :-

1. The oil drops present in cells looks red in colour.

2- Addition of few drops of osmic acid to section turn the red colour into black which confirm the presence of lipid or oil or rubber substitutes.