



INNOVATIVE COLLEGE OF PHARMACY

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CERTIFICATE

The practicals entered in this book
have been satisfactorily performed by
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Experiment-1

Aim → To perform physical and chemical test for starch

Reference → Okakate, CK, Practical Book of pharmacognosy
20th Edition Nirali Prakashan

Requirements → Beaker, test tube, weighing machine,
test tube stand, water bath

Chemicals → Starch, Fehling's solution, Iodine solution

Synonyms → Corn starch, potato starch, Rice starch

Biological source →

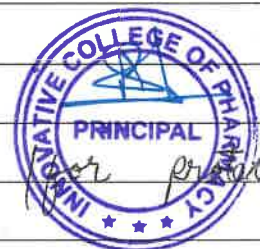
It consist of polysaccharides granules separated from grain of corns *Zoamys* belonging to family *Danaceae*

Chemical Constituent →

Starch contain chemically 2 different polysaccharides amylose as β -amylose amylopectin
Amylose is water soluble & amylopectin is water insoluble.

Use →

→ Used as a demulcent property for protect the



- mucous membrane)
- It is utilized as a diagnostic for the proper identification of crude drug
 - It is used typically or externally

Physical Test →

Color → White

Odour → Odourless

Taste → Mucilagenous

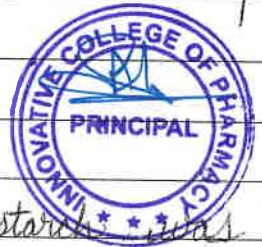
Solubility → Insoluble in water

Identification Test →

Boil 1gm of starch with 15ml of water & cool; the transparent viscous jelly is produced

Chemical Test →

Test	Observation	Inference
1. To starch mucilage add felling reagent the sol ⁿ is heated	No reduction takes place	Starch is not produced
2. Dissolve 0.2gm of starch in 15ml of water, then add Iodine sol ⁿ dropwise	Blue color appears	Starch is present



Result → Physical & chemical test for starch was performed successfully

Experiment-2

Aim → To perform physical and chemical test for agar

Reference → Kandelwal, K.R. practical pharmacognosy, Nirali prakashan 20th edition, 2010

Requirement → Test tube, stand, water bath, measuring cylinder

chemicals → α -Naphthols, alcohol, H_2SO_4 , Agar, Ruthenium red, Iodine, KOH, HCl, Caustic soda, Fehling sol^m, $BaCl_2$

Theory →

Biological source →

It consists as dried gelatinous substance obtained from gelidi manisli and other members of gelidinus family Rhodophyceae.

Chemical Constituents →

Agar is a complex tetrosaccharide and contain two different polysaccharide known as agarose and agropectin.

a) Agarose → A neutral gelling fraction

b) Agropectin → A sulphated non-gelling consist of D-galactose & L-galactose unit.



The structure of agarose is not completely known but it is believed that it consists of sulfonated polysaccharide in which galactose and uronic acid are partially established with sulphuric acid. Agarose is responsible for the viscosity of agar solution.

Uses →

- It is employed as a bulk laxative.
- It is extensively used in preparing gels in cosmetics.
- It is widely used as thickening agent in confectioneries and dairy products.
- It is used in production of ointment and medical encapsulations.
- It is used for sizing silks and paper.
- It is also used as dental impression mould base.

Physical Test →

Shape → Course powder

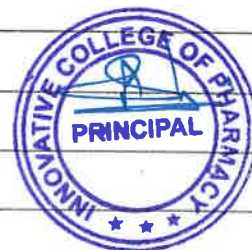
Colour → Creamish white

Odour → Odourless

Taste → Mucilaginous

Solubility → Partially insoluble

Chemical Test →



Test	Observation	Inference
Boil agar with water (aq sol ^m of agar)	Form stiff jelly on cooling	Agar is present
Agar with N ₂ Iodine sol ^m	Deep crimson brown colour	Agar is present
Add ruthenium red to agar sol ^m	Pink color produced	Agar is present
Agar is warmed with sol ^m KOH	Coronary yellow color if formed	Agar is present
Add 0.5 ml of NCl to 10ml of drug sol ^m & heat on water bath for 30min & divide in 2 parts -		
a) 1 st part - Caustic soda + fehling sol ^m heat	Reduction takes place due to galactose	
b) 2 nd part → add barium chloride to 2 nd part	White ppt is formed	Agar is present

Result → Physical and chemical test performed successfully



Experiment - 3

Aim → To perform physical and chemical test for acacia

Reference → Khandelwal, K.R, Practical "Pharmacognosy"
Nirali Prakashan, 20th edition, 2010

Requirements → Beaker, water bath, etc

Chemicals → Acacia, Fehling's solution, borax, Lead acetate

Theory →

Synonyms → Indian Gum, Gum Acacia, Gum Arabic

Biological source →

Acacia is the dried gummy exudation obtained from the stems and branches of Acacia Senegal (Y) wild or their African species of Acacia

In India it is found as dried gummy exudation obtained from stems and branches of Acacia arabica wild belonging to family leguminaceae.

Chemical Constituents →

The main chemical constituent of Acacia is arabin which is complex of calcium, magnesium and potassium salts of



Arabic acid. Arabic acid is a branched polysaccharide that yields L-arabinose, D-galactose, D-glucuronic acid and L-rhamnose units from the backbone chain of the molecule and the terminal residues of several occluded enzymes such as oxidases, peroxidases and pectinases.

Uses →

- i) The mucilage of acacia is employed as a demulscent.
- ii) It is used extensively as a vital pharmaceutical acid for emulsification and to serve as a thickening agent.
- iii) It finds its enormous applications as binding agents for tablets eg- Cough lozenges.
- iv) It is employed as colloidal stabilizer.
- v) It is used extensively in making of candy and other food products.

Physical Test →

Color → These are usually white, pale yellow and sometimes crimson-brown to red in color.

Odour → Odourless

Taste → Bland & mucillogenous

Shape & size → These are mostly spherical or oval in shape and



diameter of about 2.5-3 cm

Chemical Test →

Test	Observation	Inferences
<p>1 Fehling's Test Add dilute HCl to aq. solⁿ of acacia & then boil the solⁿ with Fehling solⁿ</p>	<p>Give a brick red ppt</p>	<p>Acacia is present</p>
<p>2 Lead Acetate Test Aq. solⁿ of acacia treated with lead acetate solⁿ</p>	<p>creamy white ppt</p>	<p>Acacia is present</p>
<p>3 Borax Test Aq. solⁿ of acacia on treatment with borax</p>	<p>stiff translucent mass is formed</p>	<p>Acacia is present</p>

Result → Physical and chemical test for acacia was performed successfully.

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11/5/24



Experiment-4

Aim → To perform physical and chemical test for castor oil

Reference → K, Khandelwal, KR practical "Pharmaceutical cognay", Nirali Prakashan, 20th Edition, 2010

Requirements → Beaker, test tube, castor oil, test tube stand, ethanol, petroleum ether

Theory →

Biological - source →

Castor oil is the fixed oil obtained by cold expression of the seeds of *ricinus communis* Linn. belonging to family ^{of} Euphorbiaceae

Chemical Constituents →

Castor oil consists of glycerides of ricinoleic acid and dihydroxy stearic acid. Ricinoleic acid is responsible for laxative property.

Ricinoleic acid is the main component of the oil. The ricinoleic acid is an 18-carbon acid having double bond in the 9-10 positions and a hydroxyl group on the 12th carbon. This combination of hydroxyl group and unsaturation occurs only in castor oil



Uses →

- a) Castor oil is mild purgative fungitatic used as an ointment base as plastic wetting agents as a lubricating agent
- b) Ricinoleic acid is used in contraceptive creams and jellies
- c) It is also used as an emollient in the preparation of lipsticks, in tooth formulation, as an ingredient in hair oil
- d) The main use of castor oil is the industrial production of coatings, also employed to make pharmaceutical and cosmetics in the textile and industries and for making plastic and fibres.

Physical Test →

Color → Colourless or slightly yellow coloured

Taste → Slightly a rid taste

Solubility → It is a viscous liquid. It is soluble in alcohol in all proportions

Specific Gravity → 0.938 - 0.969

Refractive Index → 1.4693 - 1.4370

Saponification → 177 - 187

Chemical Test →

	Test	Observation	Inference
1	Add ethanol to castor oil	Clear liquid is obtained	Castor oil is present
2	It misc with half its volume of light petroleum ether	Clear liquid is obtained	Castor oil is present

Result → Physical and chemical test for castor oil was performed successfully

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5/5/24



Experiment - 5

Aim → To perform physical and chemical test for gelatin

Reference → Khandelwal KR, A practical book of pharmacognosy, Nirali Prakashan, 12th Edition

Requirements → Test tube, Test tube stand, test tube holder, burner, alkaline solution of protein, sodaline, tannic acid, picric acid, gelatin

Theory →

i) Introduction (Biological Resource) →

It is a protein extracted by practical hydrolysis of animal collagenous tissue like skin tendons, ligaments and bones with boiling water.

ii) Chemical Constituents →

Gelatin consists of the protein glutin which on hydrolysis, gives a mixture of amino acids. The approximate amino acids contents are glycine (25%), alanine (8.7%), valine (2.5%), Leucine (32%), is leucine (4.4%), cystine and cysteine (0.1%), methionine (1%), Tyrosine (0.5%), Aspartic acid (5.61%), Glutamine acid (44.4%), Arginine (8.1%), lysine (4.1%) and Histidine (0.8%). Nutritionally gelatin is an incomplete protein lacking tryptophan. The gelling compound is known as chondrin and the



adhesive nature of gelatin is due presence of gelatin

iii) Uses →

a) Gelatin is used to prepare pastilles, pastes, suppositories, capsules, pill-coatings, gelatin sponge as suspending agent, tablet binder, coating agent as stabiliser and thickener in food.

b) Used for manufacturing rubber substitutes, adhesive composites & printing inks.

c) In bacteriology for preparing cultures and as a nutrient.

d) It forms glycerinated gelatin with glycerin which is used vehicle and for manufacture of suppositories.

e) Combined with zinc, it forms zinc gelatin which is employed as a topical protectant.

4) Physical Test →

Colour → Colourless to pale yellow

Odour → Very slight

Taste → Characteristic and boullion

Shape → Translucent sheets, flakes



Solubility → Insoluble in cold water but swells and after absorbs water, but soluble in hot water forms jelly on standing

5) Chemical Tests →

Test	Observation	Inference
1 Gelatin powder + Murrion reagent (heat)	Red ppt are observed	Gelatin is present
2 Gelatin powder + picric acid (10%)	Yellow ppt are observed	Gelatin is present
3 Aq. sol ⁿ of gelatin + tannic acid	White ppt is formed	Gelatin is present
4 Aq. sol ⁿ of gelatin + NaOH + CuSO ₄	Violet or pink is observed	Gelatin is present
5 Gelatin + Sodium lime (heat)	Ammonia evolved	Gelatin is present

Result → Physical & chemical test for gelatin was performed successfully

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15/11/24



Experiment - 6

Aim → Determination of moisture content of drug sample

Reference → K. Khandalwal, KRA practical book of pharmacognosy Nirali Prakashan 12th edition

Requirements →

Apparatus & chemical → China dish, spatula, digital weighing machine, hot air oven, desiccator and drug sample (0.5gm)

Theory →

Moisture is a key component of a compound's texture and binding properties. Effervescent medication has to stay together in the package and not dissolve b/w the user's fingers but must dissolve in a glass of water.

If the product is a powder, the powder shouldn't lump together. It is a reference to the amount of moisture present in a material. This value is often represented as a percentage of the material's mass.

Procedure →

1 Weigh the empty china dish and note



- reading
- 2 Take the sample of drug sample in china dish
 - 3 Weigh the china dish with sample in it and note the reading
 - 4 Keep the china dish in pre-heated hot air oven for 15min at $100-105^{\circ}\text{C}$ & weigh it
 - 5 After heating, keep the china dish in desiccator for 15min
 - 6 Take out the dish from desiccator and weigh the china dish with dried sample
 - 7 Now calculate % moisture content

Result → The % moisture content for the given drug sample was found to be 8%

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29/5/24



Experiment-7

Aim → To perform physical and chemical test for Honey

Reference → Khandelwal KR "Practical Pharmacognosy Nirala Prakashan 20th Edition, 2010

Requirement → Measuring cylinder, beaker, water bath, weighing machine, honey

Theory →

Synonyms → Madhu, Madh, Purified honey

Biological source → Honey is a viscous and sweet secretion stored in the honey comb by various species of bees such as *Apis dorsata*, *Apis florea*, *Apis indica*, *Apis mellifera* belonging the natural order Hymenoptera

Chemical constituents → The avg composition of honey ranges as follows:-

Moisture 14-24%, Fructose 30-47%, Dextrose 23-36%

Sucrose 0.4-5%, Dextrin & Gums 0.7% and

Ash 0.1-0.8% besides it is found to

contain small amount of essential oil

in beeswax, pollen grains, formic acid, acetic

acid, succinic acid, maltose, dextrin, colouring

pigments vitamins and an mixture of enzymes. eg- Diastase, invertase and amylase

Uses →

- It is used as a sweetening agent in confectionaries
- Being demulcent it helps to relieve dryness and is therefore recommended for cough, cold, sore throat and constipation
- Because of its natural content of easily simple sugar it is globally employed as a good source of nutrient for infants and elderly persons and convalescing patients

Physical test →

Color → Pale yellow to reddish brown color

Odour → Pleasant and characteristics

Taste → Sweet, slightly acidic

Specific gravity → 1.35 - 1.36

Specific rotation → +30 to -150

However the taste and odour of honey solely depends upon the availability of surrounding from which Nector collected on prolonged storage it usually turns opaque & granular due to crystallization of & is termed as granulated honey



Chemical Test →

Test	Observation	Inference
1 Fehling solution To an aq. sol ⁿ of honey (2ml) Fehling sol ⁿ A & B are added & the reaction mixture is heated on a steam bath for 5-10 min.	Brick red colour is produced	Presence of reducing sugar
2 Fische's Test for artificial invert sugar Honey (10ml) is shaken with petroleum or solvent ether (5ml for 5-10 min) The upper ethereal layer is separated & evaporated in a china dish on addition of 1% sol ⁿ of resorbinol in NCE (2ml)	Transient red color is formed in artificial honey The color persist for some time	Honey is present

Result → Physical & chemical test of honey was performed successfully

5/6/24



Assignment - 8

Aim → To perform chemical test for Tragacanth

Reference → Kokate CK, practical book of pharmacognosy
20th Edition Vallabh Prakashan

Requirement → Measuring cylinder, beaker, water bath,
weighing machine, tragacanth

Theory →

Synonyms → Gum tragacanth, tragacanth

Biological source → It is the dried gummy exudation obtained by incision from stem and branches of *Astragalus gummifer* L, *Astragalus membranaceus* and other species of *Astragalus* Family leguminosae

Chemical Constituents → It contains two fractions

- Tragacanthin 8-10% - water soluble
- Barsoin 60-70% - insoluble in water

Uses → Tragacanth is used as

- Demulscient and emollient
- Thickening agent
- Suspending agent
- Emulsifying agent



Physical Test →

Colour → White or pale yellow

Odour → Odourless

Taste → Mucilaginous shape

Solubility → Partly soluble in water, insoluble in alcohol

Chemical Test →

Test	Observation	Inference
1 Tragacanth boil with freshly prepared 10% Ferric chloride sol ^m	Deep yellow ppt	Tragacanth is present
2 Tragacanth + conc ammonia hydroxide + precipitated copper oxide	White ppt	Tragacanth is present
3 Tragacanth (0.1gm) + N/50 iodine sol ^m	Green colour	Tragacanth is present
4 Tragacanth + Fehling sol ^m	Red ppt	Tragacanth is present
5 0.5% w/v drug sol ^m + 2.0% w/v sol ^m of lead acetate	White ppt	Tragacanth is present



Result → Physical and chemical Test of Tragacanth
was performed successfully

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12/6/24



Experiment - 9

Aim → To determine the swelling index of Isabgol (*Plantago ovata*) seeds.

Reference → Khandelwal, KR, A practical book of pharmacognosy, Nirali prakashan, 12th edition, 2010

Requirements → 50ml of glass stopped, measuring cylinder, Isabgol seed

Theory →

Swelling index may refer to the following material parameter that quality volume change

Concible swelling Index, also known as free swelling Index in oval assay
Shrink - Swell cap activity in soil mechanics.

Procedure →

1g of Isabgol seeds are transferred to 50ml glass stopper measuring cylinder

Added 25ml of water to 50ml glass stopper measuring cylinder



The measuring cylinder are agitated after
0min for the 1st 1hr + then after every
3hrs.

Volume occupied by seeds along with
mucilage is noted

carry out simultaneously 3 determination for
any given material

calculate the mean volume of individual,
determination, related to 1g of seed

Result \rightarrow It was found to the swelling
index of Isabgol is 8ml



Experiment - 10

Aim → To determine alcohol soluble extractive value of given drug

Reference → Khandlwal KR, A practical book of Pharmacognosy, Nirali Prakashan 12th Edition

Requirements → Filter paper, beaker, weighing balance, porcelain dish, desiccation

Chemicals → Ethanol, Coarsely powdered (sample)

Theory →

The determination of ether active values help to determine the amount of soluble constituents in a given amount of medicinal plant material when extracted with solvent yields a solution containing different phytoconstituents. The composition of these containing different phytoconstituent. The composition of these phytoconstituent in that particular solvent depends upon the nature of drug solvents used. The used of



solvent can also be by means of providing preliminary information of quality of a particular drug sample. Various solvents are used according to the type of constituent to be analyzed. Alcohol soluble extractive is used for crude drugs containing tannins, glycosides, resins etc. Ether soluble extractive are used for drugs containing volatile constituents & fats.

Procedure →

1. About 5g of coarsely powdered air dried material is accurately weighed & macerated with 100ml of 70% ethanol in a glass stopper closed flask 24hrs with frequent shaking during 1st 6hrs. Allowed to stand for 18hrs.
2. It was then filtered rapidly taking precautions against loss of alcohol.
3. Then 25ml of filtered rapidly to transferred to porcelain dish of the constant weight to dry.

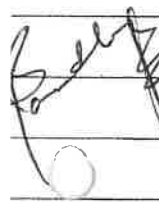


in a porcelain dish dried at 105°

cooled in a desiccation for 30min then weighed without delay

The percentage of alcohol soluble extractive was calculated with reference to the air-dried plant material

Result → The percentage amount of alcohol soluble extractive value present is 64.01.

 26/6/24

