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Diploma in Pharmacy 1st Year
Pharmacognosy
Experiment

To perform the physical and chemical tests of Agar.

Aim:

To perform the physical and chemical tests of Agar.

Reference :

Dr. Gupta G.D , Dr. Sharma Shailesh , Kaur Navjit , "Practical Manual of Pharmacognosy" Published by Nirali Prakashan , Pg.No 144 - 148

Biological Source :

Agar is the dried hydrophilic colloidal polysaccharide complex extracted from the agarocytes of algae belonging to the class Rhodophyceae. It is also obtained as the dried gelatinous substance from Gelidium amansii and several other species of red algae such as Gracilaria and Pterocladia, belonging to the family Gelidaceae. The predominant agar-producing genera are Gelidium, Gracilaria, Acanthopeltis, Ceramuum, and Pterocladia.

Materials and Apparatus Required

Test tube, conical flask, beaker, burner, water bath, Fehling's solution test, Molisch, test, concentrated HCI, barium chloride solution, ruthenium red solution, KOH, N/20 iodine solution, and tannic acid.

Theory

Agar is a jelly-like substance, obtained from algae, and derived from agarose (polysaccharide), which forms the supporting structure in the

cell wall of certain algae species, and which is released on boiling. These algae are known as agarophytes belonging to the Rhodophyta (red algae) phylum.

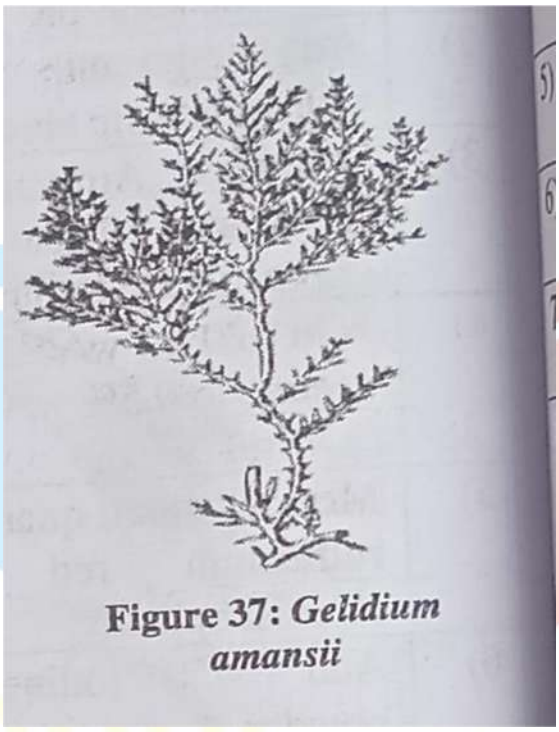


Figure 37: *Gelidium amansii*

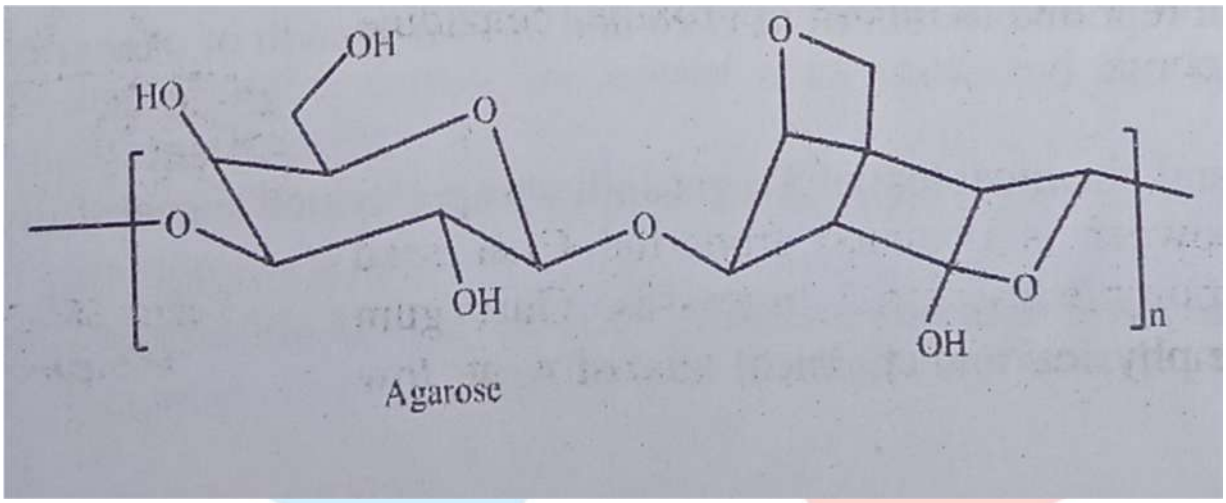
Physical Tests

1) **Colour:** Yellowish-grey or white to nearly colourless.
2) **Odour:** Odourless.
3) **Taste:** Bland and mucilaginous.
4) **Shape:** Strips, sheets, flakes, or coarse powder.
5) **Size:** Sheets are 45-60cm long and 10-15cm wide; bands are 4cm wide: strips are 4mm in width.
6) **Solubility:** Insoluble in cold water, forms a gelatinous mass after cooling hot solution; soluble in boiling water; insoluble in organic solvents.

Chemical Constituents

Agar consists of agarose and agaropectin (polysaccharides). Agarose contains D-galactose and 3.6 anhydro L-galactose units. It also contains cellulose (about 3.5%) and nitrogen containing substances (6%).

Agarose is responsible for the gel strength of agar. Agaropectin is a sulphonated polysaccharide in which galactose and uronic acid units are partly esterified with sulphuric acid. It provides viscosity to agar solutions.



Agarose

Chemical Tests

Sr. No.	Tests	Observations	Inferences
1)	Agar added to Fehling's solution test.	Red colour solution is formed.	Presence of glucose, hence presence of agar.
2)	Agar added to Molisch solution test.	Purple red colour solution is formed.	Presence of agar.
3)	1% aqueous solution of agar undergoes hydrolysis when heated for 5-10 minutes with concentrated HCl. On adding barium chloride solution to the reaction mixture	A white precipitate of barium sulphate is formed.	Presence of sulphate ions.
4)	On treating the agar powder with ruthenium red solution	Red colour is formed.	Presence of mucilage.
5)	On warming agar in a solution of KOH	A canary yellow colour develops.	Presence of agar.
6)	1% aqueous solution of agar is prepared in boiling water and cooled.	Jelly is formed.	Presence of agar.
7)	On adding N/20 iodine solution to agar solution	Deep crimson to brown colour develops.	Presence of agar.
8)	On adding an aqueous solution of tannic acid to a 0.2% solution of agar.	No precipitate is formed.	Absence of gelatine hence absence of agar.

Uses

1) It is used as an emulsifying agent, bulk laxative, and a suspending agent.
2) It is used for preparing bacteriological culture medium.
3) It is used in the production of ointments and medicinal encapsulations.
4) It is also used as a dental impression mold base.

Result :

The physical and chemical test of Agar was performed successfully.

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