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Diploma in Pharmacy 1st Year
Pharmacognosy
Experiment

To perform the physical and chemical tests of Gelatine.

Aim:

To perform the physical and chemical tests of Gelatine.

Reference :

Dr. Gupta G.D , Dr. Sharma Shailesh , Kaur Navjit , “Practical Manual of Pharmacognosy” Published by Nirali Prakashan , Pg.No 153 - 157

Biological Source :

Gentian is the dried and partially fermented rhizome and root of yellow gentian, ie., Gentiana lutea. It belongs to family Gentianaceae.

Materials and Apparatus Required

Test tube, conical flask, beaker, burner, water bath, copper sulphate, concentrated nitric acid, Millon's reagent, alcoholic solution of ninhydrin, soda lime, ammonia tannic acid, and picric acid.

Theory

Gelatin is derived from collagen obtained from various animal body parts. It is commonly used as a gelling agent in food, pharmaceutical drugs, vitamin capsules, photography, and cosmetic manufacturing.



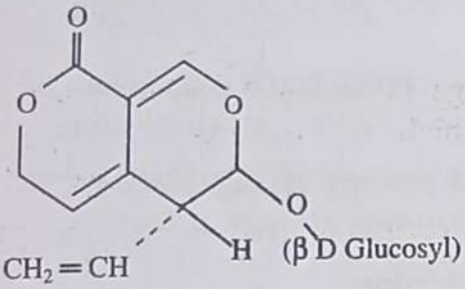
Figure 39: *Gentian Lutea* Twig

Physical Tests

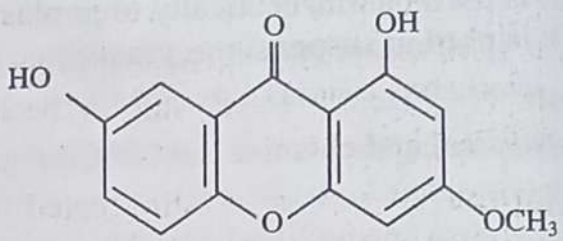
1) It is colourless or slightly yellow coloured.
2) It is transparent, brittle, and available in the form of sheets (figure 39), flakes, or course granular powder.
3) It is practically odourless and tasteless.
4) When kept in water, it swells and absorbs 5-10 times its weight of water and forms a gel in solutions below 35-40°C.
5) It is soluble in hot water, glycerol, and acetic acid; and insoluble in cold water and organic solvents.
6) It is amphoteric in nature.
7) It remains stable under dry conditions, but is attacked by bacteria when moist or in solution.
8) Its gelatinising property is reduced if boiled for a long time.
9) Its quality is determined on the basis of its jelly strength (or bloom strength) using a bloom gelometer.
10) Commercially gelatin is available in two types, i.e.. gelatin A and B
11) The isoelectric point for type A lies between pH 7 and 9.
12) Type A is incompatible with anionic compounds (acacia, agar, and tragacanth).
13) The isoelectric point for type B lies between pH 4.7 and 5.
14) Type B is used with anionic mixtures.

Chemical Constituents

Gentian contains bitter glycosides, i.e., gentiopicrin (or gentiopicroside). It is a water-soluble, crystalline compound whose bitter value is 12,000. When fermented and dried, it gives gentiogenin and glucose. The drug also has amarogentin, amaroswerin, gentioside, and gentinin (a mixture of gentiopicrin and gentisin).



Gentiopicroside



Gentianin (Gentisin)

Chemical Tests

Sr. No.	Tests	Observations	Inferences
1)	An extract of gelatine is passed under UV radiation.	Light-blue fluorescence is obtained.	Presence of gelatine.
2)	**Biuret Reaction:** A weak solution of copper sulphate is added to an alkaline protein solution (2 ml).	Red or violet colour solution is formed.	Presence of gelatine.
3)	**Xanthoproteic Reaction:** When proteins are heated with strong nitric acid. When the solution is made alkaline.	Yellow colour is produced. Orange colour is produced.	Presence of gelatine.
4)	**Millon's Reaction:** When Millon's reagent (mercuric nitrate in nitric acid with a trace of nitrous acid) is added to a protein solution and heated.	A white precipitate is produced that turns red.	Presence of gelatine.
5)	**Ninhydrin Test:** An alcoholic solution of ninhydrin is added to an aqueous solution of a protein, which is subsequently heated.	Colour changes from red to violet.	Presence of gelatine.
6)	When gelatine (1 g) is heated with soda lime.	Ammonia is produced.	Presence of gelatine.
7)	Few drops of tannic acid are added to a solution of gelatine (0.5 g) in water (10 ml).	A white buff-coloured precipitate is formed.	Presence of gelatine.
8)	When gelatin is exposed to picric acid.	A yellow precipitate is formed.	Presence of gelatine.

Uses

1) It is used in the preparation of pastilles, pastes, suppositories, capsules, pill- coatings, and gelatin sponge
2) It is used as a suspending agent, tablet binder, coating agent, stabiliser, thickener, and texturiser in food.
3) It inhibits crystallisation in bacteriology for preparing cultures.
4) It is used as a substitute for blood plasma.
5) It is also used for microencapsulating drugs in which the drug is sealed within a micro-sized capsule or beadlet, which may then be handled as a powder.
6) Glycerinated gelatin (gelatin treated with glycerine) is used as a vehicle and for manufacturing suppositories.
7) Zinc gelatin (gelatin treated with zinc) is used as a topical protectant.

Result :

The physical and chemical test of Gelatine was performed successfully.

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