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Gum Ghatti

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GUM GHATTI

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SYNONYMS Indian gum, ghatti gum, gum ghati; INS No. 419

DEFINITION Gum ghatti is a dried translucent exudate collected as 'tears' from the bark of the *Anogeissus latifolia* tree (family Combretaceae). It is manufactured by dissolving the tears in water followed by filtration and sterilization. The solution may be either dried to a gummy lump form or spray dried to a powder. It consists of complex high molecular weight water-soluble polysaccharides (on the order of several hundred kDa), present as calcium (or occasionally magnesium) salts. The product also contains small quantities of moisture, proteins, and tannins. The polysaccharides have a 1→6 linked β-D-galactose backbone with side chains containing L-arabinose units. The hydrolysis of the polysaccharide yields L-arabinose (~40%), D-galactose (~25%), D-glucuronic acid (~20%) and D-mannose (~7%), and small amounts of L-rhamnose (~1%) and D-xylose (~1%).

C.A.S. number 9000-28-6

DESCRIPTION The gum ghatti product is a dried gummy lump or a spray dried powder. The unground product of gum ghatti occurs as amorphous tears of various sizes or in broken irregular pieces; light to dark brown. It is grey to reddish-grey in the powdered form. It has little or no odour.

FUNCTIONAL USES Thickener, stabilizer, emulsifier and carrier

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) When 1 g is dispersed in 5 mL of water it forms a viscous, adhesive mucilage; insoluble in ethanol

Gum constituents L-Arabinose, D-galactose, D-mannose, L-rhamnose and D-xylose, and D-glucuronic acid should be present.

	See description under TESTS
Optical rotation (Vol. 4)	A 1 in 50 aqueous solution of the sample filtered through diatomaceous earth is levorotatory.
Precipitate formation (Vol. 4)	To 5 mL of 1 in 100 solution of the sample (filter through diatomaceous earth if necessary), add 0.2 mL of dilute lead subacetate TS. A slight precipitate may occur, and an opaque flocculent precipitate is formed upon further addition of 0.5 mL of ammonia TS.

PURITY

Loss on drying (Vol. 4)	Not more than 14% (105°, 5 h)
Total ash (Vol. 4)	Not more than 6%
Acid insoluble ash (Vol. 4)	Not more than 1%
Lead (Vol. 4)	Not more than 2 mg/kg Determine using method appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Volume 4(under “General Methods, Metallic Impurities”).
Microbiological criteria (Vol.4)	*Salmonella*: Negative in 25 g *E. coli*: Negative in 1 g

TESTS

IDENTIFICATION TESTS

Gum constituents

Detection of sugars (L-arabinose, D-galactose, D-mannose, L-rhamnose and D-xylose) and L-glucuronic acid by HPLC (Vol. 4)

Standards and reagents:

- L-Arabinose, D-galactose, D-mannose, L-rhamnose, D-xylose and L-glucuronic acid standards: >99% pure
- Trifluoroacetic acid, AR grade
- Sodium hydroxide: AR grade
- Deionized water: HPLC grade

Preparation of standard solution:
Dissolve and dilute to appropriate concentration using deionized

water.

Preparation of sample solution:
Weigh about 50 mg of sample into a screw cap test tube with a PTFE liner. Add 4 mL deionized water and 0.5 mL trifluoroacetic acid. Close the screw-cap carefully and shake well. Place the test tube in an oven at 120^{o} for 1 hour. Transfer the hydrolyzed sample to a 100 mL volumetric flask and make up to volume with deionized water. Dilute this solution 20 times and inject to HPLC.

Procedure:

- HPLC fitted with an anion-exchange column with pulsed amperometric detector, Dionex DX-50 or equiv.
- Column: Carbopack PA1, (250 mm x 4 mm, 5 µm, Dionex Co.) or equiv.
- Column temperature: 30^{o}
- Mobile phase: 5 mM NaOH (A) and 1.0 M NaOH (B); use 100% A from 0 - 30 min and 100% B from 30 - 50 min (for wash) and return to 100% A until 70 min (system stabilization)
- Injection volume: 5 µl
- Flow rate: 1.0 mL/min

Inject individual standard solutions and record retention times of each component.

Inject prepared sample solution, dilute sample solution, if required and reinject. Identify the sugars and L-glucuronic acid from the retention times of the standards.