TRAGACANTH GUM

Prepared at the 29th JECFA (1985), published in FNP 34 (1986) and in FNP 52 (1992). Metals and arsenic specifications revised at the 57th JECFA (2001). An ADI 'not specified' was established at the 29th JECFA (1985)

SYNONYMS INS No. 413

DEFINITION A dried exudation obtained from the stems and branches of *Astragalus gummifer* Labillardiere and other Asiatic species of *Astragalus* (Fam. *Leguminosae*); consists mainly of high molecular-weight polysaccharides (galactoarabans and acidic polysaccharides) which, on hydrolysis, yield galacturonic acid, galactose, arabinose, xylose and fucose; small amounts of rhamnose and of glucose (derived from traces of starch and/or cellulose) may also be present.

C.A.S. number 9000-65-1

DESCRIPTION The unground gum occurs as flattened, lamellated, straight or curved fragments or as spirally twisted pieces 0.5 - 2.5 mm thick and up to 3 cm in length; white to pale yellow, but some pieces may have a red tinge; the pieces are horny in texture, with a short fracture; odourless. The powdered gum is white to pale yellow or pinkish brown (pale tan).
Items of commerce may contain extraneous materials such as pieces of bark which must be removed before use in food.
Unground samples should be powdered to pass a No. 45 sieve (355 M) and mixed well before performing any one of the following tests.

FUNCTIONAL USES Emulsifier, stabilizer, thickening agent

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) 1 g of the sample in 50 ml of water swells to form a smooth, stiff, opalescent mucilage; insoluble in ethanol and does not swell in 60% (w/v) aqueous ethanol.

Microscopy Examine microscopically a suspension of the sample in water. Numerous angular fragments with circular or irregular lamellae, starch grains up to 15 µm in diameter, and stratified cellular membranes, which turn violet in colour on the addition of iodinated zinc chloride solution, are visible.

Precipitate formation The samples gives a precipitation reaction with a saturated aqueous solution of copper (II) acetate.

Gum constituents Identify arabinose, xylose, fucose, galactose and galacturonic acid as follows: Proceed as directed under *Gum Constituents Identification* using the following reference standards: arabinose, mannose, galactose, xylose, fucose, galacturonic acid and glucuronic acid. Arabinose, xylose, fucose, galactose and galacturonic acid should be present; mannose and glucuronic acid should be absent.

PURITY

Loss on drying (Vol. 4)	Not more than 16% (105°, 5 h)
Sulfated ash (Vol. 4)	Not more than 4%
Acid insoluble ash	Not more than 0.5% Boil the ash obtained as directed under Sulfated ash above, with 25 ml of 3 M hydrochloric acid for 5 min., collect the insoluble matter on a tared crucible or ashless filter paper, wash with hot water, ignite, and weigh. Calculate the percentage of Acid-insoluble ash from the weight of the sample.
Acid insoluble matter	Not more than 2% In a 250 ml round-bottomed flask, place 2.0 g of tragacanth and add 95 ml of methanol. Moisten the powder by swirling and add 80 ml of hydrochloric acid. Add a few glass beads of about 4 mm in diameter and heat under reflux in a water-bath for 3 h. shaking occasionally. Eliminate the glass beads and filter by suction the suspension while hot through a previously tared sintered-glass filter. Rinse the flask with a small quantity of water and pass the rinsings through the filter. Wash the residue on the filter with about 40 ml of methanol and dry at 110° to constant weight. Allow to cool in a desiccator and weigh. Calculate as percentage.
Acacia and other soluble gums	To 20 ml of a 0.25% (w/v) suspension of the sample in freshly boiled and cooled water add 10 ml of lead (II) acetate solution. A flocculent precipitate is produced. Filter, and to the filtrate add 10 ml of lead sub-acetate solution. The solution may become slightly cloudy but no precipitate is formed.
Agar	To 4 ml of a dispersion [0.5% w/v] of the sample in water, add 0.5 ml of hydrochloric acid and heat on a boiling water bath for 30 min. Add a few drops of barium chloride solution [3.65%, w/v]. No precipitate is formed.
Dextrin	Mount the sample in aqueous glycerol and examine under the microscope. The addition of 1% aqueous iodine solution does not reveal yellow-brown or purplish-red particles.
Karaya gum	(a) Boil 1 g of the sample with 20 ml of water until a mucilage is formed. Add 5 ml of hydrochloric acid and again boil for 5 min. No permanent pink or red colour develops. (b) Shake 0.2 g with 10 ml of ethanol (60%) in a 10 ml stoppered cylinder, graduated in 0.1 ml intervals. Any gel formed occupies not more than 1.5 ml. (c) Shake 1.0 g with 99 ml of water. Titrate the mucilage so formed with 0.01 M sodium hydroxide, using methyl red solution as indicator. Not more than 5.0 ml of 0.01 M sodium hydroxide is required to change the colour of the solution.
Microbiological criteria	*Salmonella* spp.: Negative in 1 g

(Vol. 4)	*E. coli*: Negative in 1 g
Lead (Vol. 4)	Not more than 2 mg/kg Determine using an atomic absorption technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the method described in Volume 4, “Instrumental Methods.”