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Myrrh

DEFINITION

Myrrh is the oleo-gum resin of stems and branches of *Commiphora molmol* Engler and other related species of *Commiphora* other than *Commiphora mukul* (Fam. Burseraceae).

IDENTIFICATION

- **A.**

Sample: 0.4 g of crushed Myrrh

Analysis: Triturate the *Sample* with 1 g of washed sand, shake for a few min with 10 mL of ethyl ether, and filter. Evaporate the filtrate to dryness in a porcelain dish, and add a few drops of nitric acid to the residue.

Acceptance criteria: A purplish violet color is produced instantly.

- **B.**

Sample: 0.1 g of powdered Myrrh

Analysis: Transfer the *Sample* to a test tube, and add 1 mL of nitric acid.

Acceptance criteria: A red color is produced. Upon addition of a crystal of vanillin, the red color deepens and does not diminish when water is added.

- **C.** Thin-Layer Chromatographic Identification Test ⟨201⟩

Standard solution: 7 µg/mL of (*E*)-anethole, 8 µg/mL of linalool, and 10 µg/mL each of (−)-bornyl acetate and (*R*)-(−)-carvone in toluene

Sample solution: 250 mg/mL of finely powdered Myrrh in alcohol. [Note—Shake for 1 min, centrifuge, and filter.]

Spray reagent: Dissolve 0.5 mL of *p*-anisaldehyde in 10 mL of glacial acetic acid. Add 85 mL of methanol, and then carefully add 5 mL of sulfuric acid. [Note—Prepare fresh immediately before use.]

Application volume: 2 µL for the *Sample solution* and 1 µL for the *Standard solution*

Developing solvent system: Toluene and ethyl acetate (93:7)

Analysis

Samples: *Standard solution* and *Sample solution*

[Note—Wash the plate in the *Developing solvent system*, and air-dry before use.]

Spray the plate with *Spray reagent*, heat in an oven at 100° for 5 min, and examine in white light.

Acceptance criteria: The chromatogram of the *Standard solution* exhibits four well-resolved spots: an olive-brown spot due to (*E*)-anethole at an R_F value of about 0.6; an orange-brown spot due to (−)-bornyl acetate at an R_F value of about 0.5; a reddish-brown spot due to (*R*)-(−)-carvone at an R_F value of about 0.4; and a deep gray spot due to linalool at an R_F value of about 0.2.

The chromatogram of the *Sample solution* exhibits an intense purplish-red spot at an R_F value of about 0.7 and two moderately intense purplish-red spots at R_F values of about 0.5 and 0.4. The chromatogram of the *Sample solution* may exhibit other spots of varying intensities, including a spot at the origin.

- **D.** Thin-Layer Chromatographic Identification Test ⟨201⟩

Standard solution: 4 µg/mL of (*E*)-anethole and 1 mg/mL of thymol in alcohol

Sample solution: Transfer 0.5 g of finely powdered Myrrh to a test tube containing 5.0 mL of alcohol, and warm the mixture in a water bath for 2–3 min. Cool, and filter.

Developing solvent system: Toluene and ethyl acetate (49:1)

Analysis

Samples: *Standard solution* and *Sample solution*

Proceed as directed. Allow the plate to air-dry, and examine under UV light at 365 nm.

Acceptance criteria: The chromatogram of the *Sample solution* shows no blue-to-violet fluorescent zones in the lower third of the chromatogram (absence of *Commiphora mukul*).

CONTAMINANTS

- **Articles of Botanical Origin** ⟨561⟩, *Limits of Elemental Impurities*: Meets the requirements
- **Articles of Botanical Origin** ⟨561⟩, *Methods of Analysis, Acid-Insoluble Ash*: NMT 5.0%
- **Articles of Botanical Origin** ⟨561⟩, *Methods of Analysis, Total Ash*: NMT 10.0%
- **Articles of Botanical Origin** ⟨561⟩, *Methods of Analysis, Foreign Organic Matter*: NMT 2%
- **Articles of Botanical Origin** ⟨561⟩, *Pesticide Residue Analysis*: Meets the requirements

SPECIFIC TESTS

- **Botanical Characteristics:** Myrrh occurs in rounded or irregular tears, or bumps of agglutinated tears, of variable sizes; brownish yellow to reddish brown, covered with some grayish or yellowish dust, externally; rich brown or reddish brown internally, sometimes marked with white spots or lines; thin splinters, translucent or almost transparent; brittle; waxy, granular, conchoidal fracture; characteristic and aromatic odor; aromatic, bitter, and acrid taste.
- **Loss on Drying** ⟨731⟩

  Sample: 1.0 g of powdered Myrrh

  Analysis: Dry the *Sample* at 100°–105° for 2 h.

  Acceptance criteria: NMT 15.0%
- **Articles of Botanical Origin** ⟨561⟩, *Methods of Analysis, Alcohol-Soluble Extractives, Method 2*: 40%–70%
- **Articles of Botanical Origin** ⟨561⟩, *Methods of Analysis, Water-Soluble Extractives, Method 2*: NLT 50%
- **Articles of Botanical Origin** ⟨561⟩, *Methods of Analysis, Volatile Oil Determination*: NLT 6.0%

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight containers, and store at controlled room temperature, in a dry place.
- **Labeling:** Label it to indicate the species of *Commiphora* from which the oleo-gum resin was obtained. Label it to indicate that it is intended for topical and oropharyngeal use only.

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
MYRRH	Nam-Cheol Kim Scientific Liaison	BDSHM2020 Botanical Dietary Supplements and Herbal Medicines
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	BDSHM2020 Botanical Dietary Supplements and Herbal Medicines

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