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Vanilla

DEFINITION

Vanilla is the cured, full-grown, unripe fruit of *Vanilla planifolia* Andrews, often known in commerce as Mexican, Bourbon, or Madagascar vanilla, or of *Vanilla tahitensis* J.W. Moore, known in commerce as Tahitian vanilla (Fam. Orchidaceae). Vanilla yields NLT 12.0% of anhydrous, diluted alcohol-soluble extractive.

COMPOSITION

- **CONTENT OF ANHYDROUS, DILUTED ALCOHOL-SOLUBLE EXTRACTIVE**

Sample: 2 g of Vanilla

Analysis: Place the *Sample*, finely cut or coarsely powdered and accurately weighed, in a suitable flask. Add 70 mL of diluted alcohol, shake by mechanical means for 2 h or for 8 h at 30-min intervals, and allow to stand overnight. Decant the liquid into a filter, and wash the flask and residue with small portions of diluted alcohol, passing the washings through the filter until the filtrate measures 100.0 mL. Mix the filtrate well, evaporate a 50.0-mL portion in a suitable tared container on a steam bath to dryness, and dry the residue at 105° for 4 h. The weight obtained represents the yield of anhydrous, diluted alcohol-soluble extractive from one-half of the portion of Vanilla taken. Calculate the yield for the entire *Sample* taken.

Acceptance criteria: NLT 12.0%

CONTAMINANTS

- **ARTICLES OF BOTANICAL ORIGIN (561), Pesticide Residue Analysis:** Meets the requirements

SPECIFIC TESTS

- **BOTANICAL CHARACTERISTICS**

Unground Vanilla

Macroscopic: Linear, flattened capsules of 12–35 cm in length and 5–9 mm in width, with an apex terminating in a flat, circular scar and a gradually tapering base that is more or less curved or hooked; or in Tahitian vanilla, broad in the middle and tapering toward either end, the base closely resembling the summit. It is flexible and tough, nearly black, dusky brown to moderate brown externally, longitudinally wrinkled, moist, glossy, and occasionally has efflorescence of acicular or prismatic crystals of vanillin. Internally it is unilocular, with a brownish-black pulp and numerous minute seeds. Occasional capsules are split near the summit into three parts.

Microscopic: The epidermis has a distinct cuticle and occasional stomata. The epidermal cells contain red to brown bodies and occasional prisms of calcium oxalate or crystals of vanillin. It has a collenchyma layer of one or two rows of cells, a thick sarcocarp composed of parenchyma and an interrupted circle of fibrovascular bundles, the latter leptocentric with a few vessels, and an outer circle of fibers with thin, strongly lignified walls and numerous transverse simple pits. The vessels with walls have slit-like pits or spiral thickenings; the parenchyma cells are usually thin-walled and deeply undulate, some thick-walled with oblique, slit-like pits or broad spiral bands, and contain occasional bundles of acicular crystals of calcium oxalate, up to 400 µm in length, or a thin protoplasmic layer enclosing numerous oil globules. It has an endocarp composed of placental and interplacental regions; the placental region consists of six bifid placentas extending into the cavity of the fruit and bears irregularly trianguloid, black to reddish, flattened seeds, up to about 250 µm in diameter, having a deeply reticulate seed coat; the interplacental regions show long, nearly straight hairs more or less matted together by their gummy, resinous secretion.

Powdered Vanilla

Macroscopic: Dusky brown to nearly black

Microscopic: The principal elements of identification are fragments of parenchyma of the sarcocarp with long, oblique, slit-like walls or broad spiral bands, calcium oxalate crystals of acicular outline and up to 400 µm in length, and monoclinic prisms up to 35 µm in length. It has numerous unicellular, nearly straight, glandular hairs, fragments of the seed coat with polygonal stone cells, and slender crystals of vanillin.

- **TEST FOR VANILLIN**

Analysis: Place a few of the crystals, occurring as an efflorescence on the fruit, on a microslide or watch glass, and add 1 drop of phloroglucinol TS and 1 drop of hydrochloric acid.

Acceptance criteria: The solution immediately acquires a red color.

ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE:** Preserve in tight containers, and store in a cold place.
- **LABELING:** The label states the Latin binomial and, following the official name, the part(s) of the plant contained in the article. The commercial variety of Vanilla, whether Mexican, Bourbon, Madagascar, or Tahitian, is also stated on the label. The label states that Vanilla that has become brittle is not to be used.

Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
VANILLA	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

Chromatographic Database Information: [Chromatographic Database](#)

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