0052 - Griffonia for 5-HTP by HPLC

Botanical Name: Griffonia simplicifolia

Common Names: 5-HTP

Parts of Plant Used: Seeds

Uses: As an antidepressant, to treat serotonin deficiency syndrome, to treat headache, to control weight.

Modes of Action:
L-5-Hydroxytryptophan (5-HTP), a serotonin precursor, is the bioactive component in griffonia seeds. Several double-blind placebo-controlled clinical trials have been performed on this compound. 5-HTP was found to treat headache, to work as an antidepressant drug, to reduce body weight, to treat primary fibromyalgia syndrome, and to inhibit panic.\(^1\text{-}^7\)

Chemical Markers:
L-5-hydroxytryptophan is the main chemical component in griffonia seeds and a recent study found that the content of 5-HTP can reach 20.83% in the fresh material.\(^8\) Indole-3-acetylaspartic acid, 5'-hydroxyindole-3-acetic acid, griffonin, and griffonilide also were detected in griffonia.\(^9,^{10}\) 5-Hydroxytryptamine was found in the pods and, in lower concentration, in the leaves of mature plants. In griffonia seed oil, the fatty acid composition is 18:2 = 60%, 16:0, 18:0, and 18:1 = 9% to 18%, and 20:0 = 3% to 4%. The main sterols are \(\beta\)-sitosterol (60%), stigmasterol (29%), and campesterol (11%).\(^{11}\) As 5-HTP has been proven to be the bioactive component, it is used as the marker compound for quality control of griffonia seed extract.

Methods of Analysis
HPLC is the most accepted method for 5-HTP analysis. Various solvents have been used to extract 5-HTP from griffonia seeds; 50% methanol proved to be the most effective solvent.\(^8\)
Method 1:
The method of Lemarie and Adosraku\(^8\) was used.

**Sample Preparation:**
Transfer 1 g of powdered seed sample to a 100-mL volumetric flask, add 70 mL of 50% methanol, and shake vigorously for 10 minutes. Fill to volume with 50% methanol.

**Chromatography:**
Column: Tosahaaas ODS-80TS TSK-GEL9R0, 5 \(\mu\)m, 250 \(\times\) 4.6 mm.
Mobile phase: Water (5 mM phosphate buffer at pH 4.8)–methanol (97:3) isocratic.
Flow rate: 1.5 mL/minute
Injection volume: 20 \(\mu\)L
Detection wavelength: 275 nm

**Validation Data:**
Not available

Method 2:
The unpublished method of Mingfu Wang was used.

**Sample Preparation:**
Accurately weigh 20 mg of 5-HTP or 100 mg of griffonia seed powder into a 100-mL volumetric flask, add 75 mL of 50% methanol and sonicate for 30 minutes. Cool to room temperature and fill to volume with 50% methanol.

**Chromatography:**
Column: Phenomenex Luna C18 (2), 5 \(\mu\)m, 250 \(\times\) 4.6 mm.
Mobile phase: Water (0.1% trifluoroacetic acid)–acetonitrile.
Gradient: 2%B to 16%B in 10 minutes.
Flow rate: 0.8 mL/minute
Injection volume: 10 \(\mu\)L
Detection wavelength: 280 nm

**Validation Data:**
Not available
Representative HPLC Chromatogram for Griffonia Seed Powder Run by Method 2.

References:


