

ICS 67.020
CCS C 53



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 30615-2014

**National Food Safety Standard -- Food Additives -- Antioxidant
of Bamboo-leaf**

食品添加剂 竹叶抗氧化物

(English Translation)

Issued on: April 29, 2014

Implemented on: November 1, 2014

**Issued by: National Health and Family Planning Commission of the
People's Republic of China**

Table of Contents

- 1 Scope
- 2 Classification
- 3.1 Iso-orientin
- 4 Technical requirements
- 4.1 Sensory requirements
- 4.2 Physical and chemical indicators

1 Scope

This standard applies to the raw materials of the bamboo leaves of *Phyllostachys Siet.EzZucc*, which are extracted and refined.

Addition of bamboo leaf antioxidant.

Note: The raw material for the production of food additives bamboo leaf antioxidant bamboo leaves for the angiosperms (Angiospermae), monocotyledon (Monocotyledonae), Graminales, Graminae, Bambusoideae, *Phyllostachys*, Variety 1 year ~ 2 years old leaves.

2 Classification

Bamboo leaf antioxidants are divided into water-soluble products and fat-soluble products according to their solubility. The water-soluble products, the main active ingredient for the bamboo leaves Glycyrrhizin (orientin glycosides, orientin, vitexin, isovitexin) and p-coumaric acid, chlorogenic acid, etc .; fat-soluble products, the main active ingredient the esterification products of coumaric acid, ferulic acid, alfalfa and bamboo leaf flavonoids.

3 chemical composition of the main components, structural formula, molecular formula and relative molecular mass

3.1.1 Chemical name

5,7,3', 4'-tetrahydroxyflavone-6-C-glucoside.

3.1.2 Molecular formula

C₂₁H₂₀O₁₁.

3.1.4 Relative molecular mass

448.38 (according to 2007 International relative atomic mass).

3.2 on coumaric acid

3.2.1 Chemical name

3- (4-hydroxyphenyl) -2-propenoic acid.

3.2.2 Molecular formula

C₉H₈O₃.

3.2.4 Relative molecular mass

164.16 (according to 2007 International relative atomic mass).

4.1 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 sensory requirements

The project requires a test method Color yellow to yellow brown or brown, moisture when the color gradient deep odor Water-soluble products with a typical bamboo leaves fragrance; fat-soluble products clear Fragrance, slightly ester flavor State powder, allowing a small amount of particles Take the appropriate sample in a 50 mL beaker and observe the color under natural light Ze and state, smell the smell

4.2 Physical and chemical indicators

Physical and chemical indicators should be consistent with the provisions of Table 2.

Table 2 Physical and chemical indicators

project

index

Water-soluble fat-soluble Testing method Total phenol (mass fraction) /% $\geq$ 40.0 20.0
Appendix A A.4 Dietary orientin (mass fraction) /% $\geq$ 2.0 - A.5 on coumaric acid (mass fraction) /% $\geq$ - 0.5 A.6 Water solubility (25 ° C)/(g/100g) $\geq$ 6.0 - A.7

Table 2 (continued)

project

index

Water-soluble fat-soluble Testing method Ethyl acetate Solubility (25 ° C)/(g/100g) $\geq$ - 3.0
 A.8 Residue on ignition (mass fraction) /% $\leq$ 5.0 3.0 A.9 Drying (mass fraction) /% $\leq$ 8.0
 GB 5009.3 Total arsenic (in As)/(mg/kg) $\leq$ 3.0 GB/T 5009.11 or GB/T 5009.76 Lead
 (Pb)/(mg/kg) $\leq$ 2.0 GB 5009.12 or GB/T 5009.75 Note. Water-soluble products can be
 diluted with dextrin.

Appendix A

Testing method

A.1 Safety Tips

Some of the reagents used in this standard test method are toxic or corrosive and operate in accordance with the relevant regulations and should be handled with care. If splashing to the skin should be immediately rinse with water, severe cases should be treated immediately. When using volatile acids, do it in a fume hood.

A.2 General provisions the reagents and water used in this standard, when not specified in other requirements, refer to the analysis of pure reagents and GB/T 6682 provides three levels of water. test the standard solution, impurity standard solution, preparation and preparation used in the test shall be classified according to GB/T 601, GB/T 602, GB/T 603. The solution used in the test refers to the aqueous solution when it is not specified in the formulation of the solvent.

A.3 Identification test A.3.1 Identification of chemical reagents A.3.1.1 Reagents and materials A.3.1.1.1 Ethanol aqueous solution (95 5).

A.3.1.1.2 Ferric chloride ethanol solution. 10g/L.

A.3.1.1.3 Aluminum trichloride ethanol solution. 10g/L.

A.3.1.2 Identification method A.3.1.2.1 Weigh about 0.5g sample dissolved in 100mL ethanol, take this solution 1mL drop 2 drops to 3 drops of ferric chloride ethanol solution, the solution was dark blue or blue-violet.

A.3.1.2.2 Weigh about 0.5g sample dissolved in 100mL ethanol, take 1mL of this solution drop 2 drops to 3 drops of aluminum trichloride ethanol solution, the solution was bright yellow.

A.3.2 Spectral identification A.3.2.1 Identification of infrared transmission spectra Using potassium bromide compression method, in accordance with the provisions of GB/T 6040 test, the infrared spectrum of the sample should be consistent with the control map (control chart See Appendix B).

A.3.2.2 UV absorption spectroscopy identification Weigh about 15mg sample dissolved in 100mL chromatography pure methanol, in the wavelength range of 200nm ~ 600nm UV scan, try the UV spectrum should be consistent with the control map (see Appendix C for the control chart).

A.3.3 Analysis of active ingredients and their fingerprints A.3.3.1 Methodological summary the samples were chromatographed on pure methanol and acetonitrile-acetic acid aqueous solution (99) as the mobile phase. The liquid chromatographic column and purple External detector or diode array detector, with containing tangent glycosides, orientin, isovitexin, vitexin, p-coumaric acid, chlorogenic acid, caffeic acid, Wei acid and other eight reference standard of the standard map and sample map were compared to determine the effective components of bamboo leaf antioxidant products and category differences.

A.3.3.2 Reagents and materials A.3.3.2.1 Acetonitrile (chromatographic purity).

A.3.3.2.2 Methanol (chromatographic purity).

A.3.3.2.3 glacial acetic acid (excellent grade pure).

A.3.3.2.4 Water (ultrapure water).

A.3.3.2.5 Contaminine, orientin, isovitexin, vitexin, p-coumaric acid, chlorogenic acid, caffeic acid, ferulic acid standard. purity $\geq 98.0\%$.

A.3.3.2.6 Mixing solution. Weigh each of the eight reference substances (A.3.3.2.5) each 5mg (accurate to 0.0001g), dissolved with methanol and Set to 10mL, mix, set the refrigerator to save, this solution is 8 standard reference mixture solution.

A.3.3.3 Instruments and equipment A.3.3.3.1 High performance liquid chromatograph.

A.3.3.3.2 UV detector. variable wavelength.

A.3.3.3.3 Data processing systems. Chromatographic workstations or data processors.

A.3.3.4 Reference chromatographic conditions the recommended columns and typical operating conditions are shown in Table A.1. Determination of Antioxidant Fingerprints of Bamboo Leaves A typical high performance liquid chromatogram is given in Appendix D in D.1 and D.2. Other columns and chromatographic operating conditions that can achieve the same degree of separation can be used.

Table A.1 Columns and Typical Chromatographic Operating Conditions

Project operating conditions Column C18ODS column, length 250mm, inner diameter 4.6mm, built-in C18 filler, particle size 5 μ m or equivalent Column temperature/ $^{\circ}$ C 40 Mobile phase A. acetonitrile; B. acetic acid aqueous solution (1 99) Gradient elution conditions 0min ~ 15min, A15%, B85%; 15min ~ 25min, A15% ~ 40%, B85% ~ 60% 34min, A40%, B60%; 34min ~ 40min, A40% ~ 15%, B60% ~ 85% Flow rate/(mL/min) 1 Detector detection wavelength/nm 330 Injection volume/ μ L 10 A.3.3.5 Analysis steps A.3.3.5.1 Sample handling Accurately weighed the sample 100mg (accurate to 0.0001g), dissolved in methanol and volume to 100mL, through the microporous membrane (0.45 μ m) over Filter, that sample solution.

A.3.3.5.2 Specimen determination Accurately absorb the sample solution 10 μ L, in the