

Asian Ginseng

Asian Ginseng consists of the dried roots of *Panax ginseng* C.A. Meyer (Fam. Araliaceae). It contains not less than 0.2% of ginsenoside Rg₁ and not less than 0.1% of ginsenoside Rb₁, both calculated on the dried basis.

Packaging and storage— Preserve in well-closed containers, and store in a cool, dry place.

Labeling— The label states the Latin binomial and, following the official name, the part of the plant contained in the article.

Botanic characteristics—

Macroscopic— Fusiform or cylindrical roots, with distinct aromatic odor, sometimes branched, typically 1 to 10 cm, sometimes up to 20 cm in length and up to 2.5 cm in diameter at the crown, with one or more stem scars. Externally pale yellow to golden, rough textured in the lower part, with prominent horizontal rings and fine longitudinal ridges as a result of drying. Root scars or fine rootlets are present. Fractures are short with the fractured surface, white to ivory, exposing a ring of secretory canals present in secondary phloem.

Histology—

Transverse section of root— Multiple layers of thin-walled cork cells present. Secondary phloem characterized by conspicuous air lacunae, abundant starch-containing storage parenchyma, few sieve elements, and rings of schizogenous secretory cells. Xylem characterized by abundant starch-containing storage parenchyma, few tracheary elements, and a lack of secretory canals. Druse crystals are sometimes present with vascular parenchyma cells.

Identification—

A: [Thin-Layer Chromatographic Identification Test](#) 201 —

Test solution— Transfer 1.0 g of finely powdered Asian Ginseng to a 25-mL flask fitted with a reflux condenser. Add 10.0 mL of a mixture of methanol and water (7:3), and heat under reflux for 15 minutes. Cool, filter, and dilute the filtrate with methanol to 10.0 mL.

Standard solution: about 5 mg per mL each of arbutin and escin, in methanol.

Application volume: 20 µL, as bands.

Developing solvent system: the upper layer of a mixture of butyl alcohol, water, and ethyl acetate (10:5:2.5) in an unsaturated chamber.

Spray reagent— Dissolve 0.5 mL of anisaldehyde in 10 mL of glacial acetic acid, add 85 mL of methanol, and mix. Carefully add 5 mL of sulfuric acid to this mixture, and mix.

Procedure— Proceed as directed in the chapter. Remove the plate from the developing chamber, and allow it to dry. Spray with Spray reagent. Heat the plate at 105 °C to 110 °C for about 10 minutes, and examine the plate. The chromatogram of the Standard solution shows, in the upper third, a brown zone corresponding to arbutin and, in the lower third, a gray zone corresponding to escin. Between these two zones, the chromatogram of the Test solution exhibits violet-gray zones corresponding to ginsenoside Rg1 in the upper portion and to ginsenoside Re in the middle. A violet-gray zone corresponding to ginsenoside Rb1 is located at the same R_F value as the gray zone corresponding to escin in the chromatogram of the Standard solution. Other, less intense bands may be observed between the zones due to ginsenosides Rb1 and Re, and the zone closest to the origin corresponds to ginsenoside Rc. Other spots may be visible in the lower third of the chromatogram.

B: The retention times of the peaks for ginsenosides Rg1, Re, Rf, Rb1, Rc, and Rd in the chromatogram of the Test solution correspond to those in the chromatogram of the Standard solution, as obtained in the test for Content of ginsenosides Rb1 and Rg1. The ratio of the peak area for ginsenoside Rb2 to the peak area for ginsenoside Rb1 is not less than 0.4.

[Microbial enumeration](#) [2021](#) — The total aerobic microbial count does not exceed 10⁴ cfu per g. The total combined molds and yeasts count does not exceed 100 cfu per g, and it meets the requirements of the tests for absence of *Salmonella* species, *Escherichia coli*, and *Staphylococcus aureus*.

[Loss on drying](#) [731](#) — Dry 1.0 g of finely powdered Asian Ginseng at 105 °C for 2 hours: it loses not more than 12.0% of its weight.

[Foreign organic matter](#) [561](#) : not more than 2.0%.

[Total ash](#) [561](#) : not more than 8.0%, determined on 1.0 g of finely powdered Asian Ginseng.

[Acid-insoluble ash](#) [561](#) : not more than 1.0%.

[Alcohol-soluble extractives, Method 2](#) [561](#) : not less than 14.0%.

[Pesticide residues](#) [561](#) : meets the requirements.

[Heavy metals, Method III](#) [231](#) : 20 µg per g.

Content of ginsenosides Rb₁ and Rg₁—

Solution A, Solution B, and Chromatographic system— Proceed as directed in the Content of ginsenosides under Powdered Asian Ginseng Extract.

Standard solution— Transfer an accurately weighed quantity of USP Powdered Asian Ginseng Extract RS, equivalent to about 2 mg of ginsenoside Rg₁, to a suitable container, and dissolve in 10.0 mL of a mixture of water and alcohol (6:4). [note—The concentrations of ginsenoside Rg₁ and ginsenoside Rb₁ in this solution are not expected to be equal, and are determined on the basis of the labeled quantities present in USP Powdered Asian Ginseng Extract RS.]

Test solution— Reduce about 100 g of Asian Ginseng to a powder, and transfer about 1.0 g of the powder, accurately weighed, to a 100-mL round-bottom flask fitted with a reflux condenser. Add 50 mL of a mixture of water and alcohol (6:4) and a few grains of pumice, and boil on a water bath under reflux for 1 hour. Cool, and filter. Wash the flask and the residue with 20 mL of a mixture of water and alcohol (6:4), and pass through the same filter. Combine the filtrates, and evaporate in a rotary evaporator at 50 to dryness. Dissolve the residue in 10.0 mL of a mixture of water and alcohol (6:4).

Procedure— Separately inject equal volumes (about 10 µL) of the Standard solution and the Test solution into the chromatograph, record the chromatograms, and measure the areas for the major peaks. Calculate the percentages of ginsenosides Rb₁ and Rg₁ in the portion of Asian Ginseng taken by the formula:

$$1000(C/W)(r_U / r_S)$$

in which C is the concentration, in mg per mL, of ginsenoside Rg₁ or ginsenoside Rb₁ in the Standard solution; W is the weight, in mg, of Asian Ginseng taken to prepare the Test solution; and r_U and r_S are the peak responses of ginsenoside Rg₁ or ginsenoside Rb₁ obtained from the Test solution and the Standard solution, respectively.