

***Astragalus mongholicus* Bunge**  
 syn. *A. membranaceus* Bunge,  
*A. membranaceus* Bunge var.  
*mongholicus* (Bunge) P. K. Hsiao

**Astragalus Root**

**Radix Astragali**

**Pinyin: Huang qi**

**Fabaceae**

The use of astragalus originates from Chinese medicine, though its repute as an immune tonic has caused it to be integrated into Western herbal medicine as well. According to China's pharmacopoeia (PPRC 2005), *A. membranaceus* var. *membranaceus* or *A. membranaceus* var. *mongholicus* may be used interchangeably as *Radix Astragali*. However, the draft treatment of the genus *Astragalus* in the *Flora of China* no longer recognizes *A. membranaceus* as a species, placing it instead within *Astragalus mongholicus* Bunge, the species name used in this text. Another species of plant known in Chinese pinyin as hong qi (*Hedysarum polybotris*) may mistakenly be traded as huang qi (*Astragalus*). *Hedysarum* spp. can be identified by its fiber bundles, which are surrounded by parenchymatous cells containing prisms of calcium oxalate 7–14  $\mu\text{m}$  in diameter and up to 22  $\mu\text{m}$  long. *Astragalus* lacks these crystals.

**Transverse section:** Narrow cork; phelloderm is a few cells thick and cells are tangentially elongated and slightly thickened; outer secondary phloem with scattered groups of fibers; in old roots, sclereids may occur; inner

secondary phloem has a regular structure of fiber bundles in radial rows, with bundles separated by parenchyma; colorless fibers vary considerably in diameter and degree of wall thickening, frequently having only the primary wall lignified; radial strands of sieve cells occur near the vascular cambium; outer secondary phloem is frequently ruptured at the medullary rays; secondary xylem is in distinct radial rows consisting of vessels, groups of fibers, and parenchyma; vessels are up to 80  $\mu\text{m}$  diameter, solitary or in groups of two or three; fibers are similar in structure to those in the secondary phloem; narrow medullary rays are curved toward the outside, and cells are mostly thin walled, some with thicker walls and small pits; not all rays reach the root center, giving the xylem strands a branched appearance; at the center is primary xylem, surrounded by few parenchyma cells; crystals are absent.

**Longitudinal section:** Fibers with horizontal or oblique slit-like pits; fibers within bundles often loosely connected; vessels have relatively short vessel members with reticulate or bordered-pitted walls.

**Starch:** Abundant in all parenchyma cells; simple, spherical granules, 2–10  $\mu\text{m}$  diameter.

**Powder:** Fragments of cork; bundles of loosely arranged fibers in longitudinal view, with fibers variable in width and wall thickening; vessels have short vessel members; parenchyma; starch; crystals are absent.

