

Ephedra sinica* Stapf, *Ephedra equisetina* Bunge, *E. intermedia

Ephedra Stem

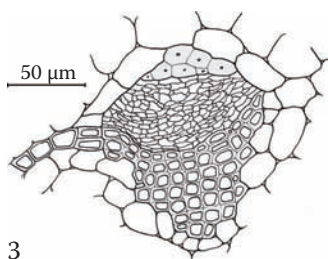
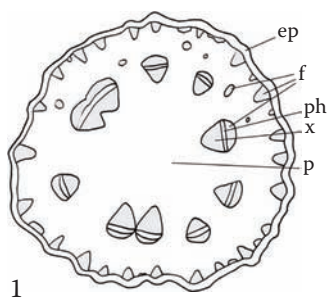
Herba Ephedrae

Pinyin: Ma huang

Ephedraceae

Ephedra is one of the primary herbal decongestants used worldwide. It formed the basis of ephedrine-based pharmaceuticals and continues to be used for this purpose today. Due to concerns over the misuse of concentrated ephedrine products for weight loss and athletic performance, ephedra for use as a dietary supplement ingredient has been banned. According to the Chinese pharmacopoeia (PPRC 2005), three species of *Ephedra* are accepted interchangeably as *Herba Ephedrae*: *E. sinica* Stapf, *E. equisetina* Bunge, and *E. intermedia* Schrenk ex C. A. Mey. Although different species and varieties are used interchangeably, the herb is generally not subject to adulteration.

Surface view: Rectangular, axially elongated epidermal cells; anomocytic stomata with guard cells sunken below the surface.



Transverse section: Surface ridges and furrows create an uneven outline; epidermal cells are covered with a thick yellow-green cuticle and have a nearly transparent secondary wall; deeply sunken anomocytic stomata; opposite the surface, ridges are small triangular bundles of fibers that contact the epidermis; cortex of thin-walled, mostly radially elongated parenchyma cells, with scattered fibers or small groups of fibers; individual collateral vascular bundles are triangular and arranged in a ring; phloem bundles are capped by fibers; xylem is regular, consisting of narrow tracheids that are all of a similar diameter (up to 15 μm); medullary rays are parenchymatous or, in older stems, composed of cells with thickened walls; pith consists of large, thin-walled, circular parenchyma with conspicuous triangular intercellular spaces; occasional fibers; pith or cortex cells are frequently filled with reddish brown matter; crystals of undefined shape are found throughout and are birefractive, but not composed of calcium oxalate (tested with concentrated sulfuric acid).

Longitudinal section: Papillose epidermis; tracheids with bordered pits; protoxylem with some helical or annular vessels.

Powder: Fragments of fibers; parenchyma with crystals; tracheids with bordered pits; vessels with helical or annular walls; epidermis with sunken anomocytic stomata.

