

Clematis chinensis Retz.**Chinese Clematis Rhizome and Root***Radix Clematidis chinensis*

Pinyin: Wei ling xian

Ranunculaceae

Clematis is primarily used in traditional Chinese medicine. According to China's pharmacopoeia, *Radix Clematidis* may consist of the roots and rhizomes of *Clematis chinensis* Osbeck, *Clematis hexapetala* Pall., or *Clematis manshurica* Rupr. These species are mostly traded interchangeably without differentiation. The rhizomes are often in a state of partial decay, with mostly lignified tissues remaining. All roots examined for this characterization showed only primary growth. A description of the stem bases is included because they often are found attached to the rhizome in trade. Supplies of botanical material coming from the genus *Clematis* are often labeled simply as *Clematis*. Because of this, the rhizome and root of *Clematis chinensis* may occasionally be substituted for the stem of *Clematis armandii* or *Clematis montana* or vice versa, despite the obvious macroscopic differences between the stems of the latter two species and the rhizomes and roots of *C. chinensis*. For the microscopic differentiation of *C. chinensis* and *C. armandii*, see the entry for *C. armandii*.

A. Rhizome

Transverse section: Bark is scalloped in outline, with convex areas aligned with the secondary xylem and concavities aligned with medullary rays; thin cork consists of narrow bands of red-brown parenchyma alternating with bands of colorless parenchyma; tangentially elongated groups of fibers occur interior to the cork and exterior to the secondary phloem; these groups are separated by parenchyma; outside the medullary rays, fibers are replaced by sclereids; secondary xylem consists of cuneiform regions of vessels, tracheids, and groups of light-colored fibers alternating with medullary rays; vessels up to 100 μm diameter; the outer portion of the medullary rays consists of thin-walled parenchyma that is partially ruptured; in the inner portions of the rays, parenchyma is replaced by fibers; in the innermost regions of the secondary xylem, vessels are largely replaced by pitted fibers oriented in varying directions; pith consists of parenchyma

and large sclereids, up to 110 μm diameter, with conspicuous wall striations; crystals are absent.

Longitudinal section: Similar to root, except the sclereids are irregular in outline and the pith is absent.

B. Root

Transverse section: Dark brown epidermal cells, with horseshoe-like wall thickenings (the outer wall is the thickest); hypodermis of radially elongated cells, most having a thickened outer cell wall; cortical parenchyma of circular cells with slightly thickened and pitted walls and numerous intercellular spaces; embedded in the parenchyma are numerous circular yellow sclereids, 20–55 μm diameter, that have a white primary cell wall, conspicuous concentric striations, and a small lumen; sclereids may be absent; endodermis is distinct, with a Casparian strip; diarch or triarch vascular bundle; phloem fibers are solitary or in small groups; compact xylem consists of vessels, tracheids, and fibers; vessels up to 90 μm diameter; starch and crystals are absent.

Longitudinal section: Sclereids are slightly axially elongated, up to 270 μm in length, with straight walls, few pit channels, and conspicuous striations; phloem fibers with numerous pit channels; pitted vessels and tracheids, with a slight spiral wall texture; pitted xylem fibers.

C. Basal Stem

Transverse section: Remnants of epidermis and cortical parenchyma occur; fibers may be present in groups radially aligned with the vascular bundles; cork cambium occurs interior to these fibers; sclereids form a nearly continuous narrow ring interior to the cork; well-developed collateral vascular bundles; inner parts of the xylem are embedded in a continuous ring of thickened and lignified sclereids; large pith is irregular in outline; cells of the outer pith are thin walled, but those in the center are thickened, pitted, and lignified; crystals are absent.

Starch: Present in all parenchyma cells of the rhizome and stem, absent in the root; granules are mostly simple and may be up to three compounds, small, spherical to polygonal, up to 6 (up to 10) μm diameter.

Powder: Lignified fibers in bundles or dispersed; tracheids; granular epidermal cells with dark brown outer