

***Codonopsis pilosula* (Franch.)  
Nannf., *Codonopsis tangshen* Oliv.**

**Codonopsis Root**

*Radix Codonopsis*

Pinyin: Dang shen

*Campanulaceae*

*Codonopsis* is one of the primary energy tonics used in traditional Chinese medicine. For this purpose it is specifically used to enhance digestive powers, is considered similar in activity to *Panax ginseng*, and is often used as a lower cost alternative to ginseng. According to the Chinese pharmacopoeia (2005), *Radix Codonopsis* may consist of the roots of *Codonopsis pilosula* (Franch.) Nannf. or *Codonopsis tangshen* Oliv.

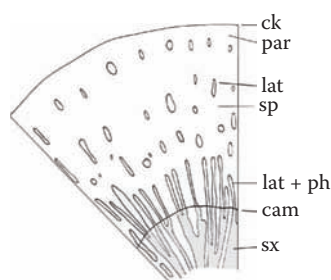
**Transverse section:** Cork up to 10 cell layers thick; between the cork and secondary phloem is a broad zone dominated by parenchyma; sclereids, tangentially elongated up to 130  $\mu\text{m}$ , occur in this zone and the cork, but may be absent in older roots; laticifers with gray or grayish yellow contents occur in radial rows in the outer

parenchyma and secondary phloem; exterior phloem cells are compressed; secondary xylem vessels up to 80  $\mu\text{m}$  diameter occur in short radial rows or groups separated by parenchyma; broad medullary rays consist of several rows of parenchyma cells; ray parenchyma in older roots may be thickened but unlignified, with a stellate lumen; most parenchyma cells contain starch and few contain inulin; crystals and fibers are absent.

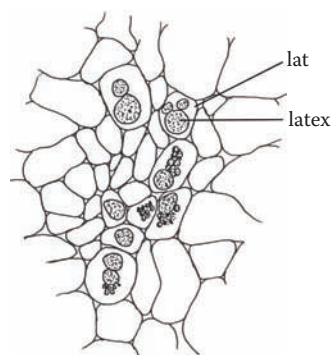
**Longitudinal section:** Reticulate or scalariform vessels; elongated parenchyma cells, with anastomosing laticiferous vessels (laticifers show better contrast when the section is prepared with water).

**Starch:** Occurs in most parenchyma; simple or two- or three-compound granules, spheroidal or elliptical, up to 15  $\mu\text{m}$  diameter.

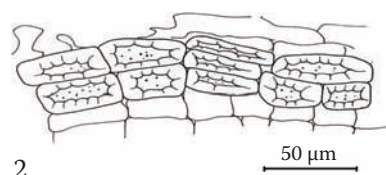
**Powder:** Fragments of cork; parenchyma with laticifers in transverse and longitudinal views; reticulate or scalariform vessels; sclereids; starch.



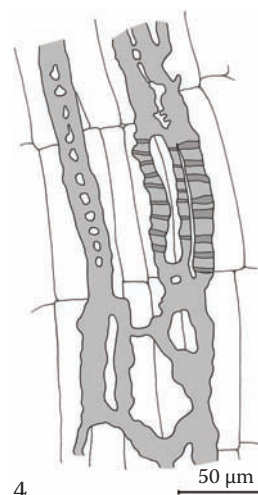
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