Frangula purshiana (DC.) J. G. Cooper syn. *Rhamnus purshiana* DC.

Cascara Sagrada Bark

Cortex Frangulae purshianae

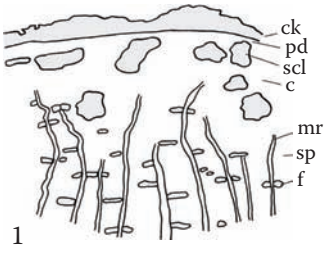
Rhamnaceae

Cascara sagrada is one of the most widely used botanical laxatives in North America. Formerly named *Rhamnus,* cascara contains anthraquinone glycosides and is closely related to other anthraquinone-containing botanicals such as frangula (aka buckthorn; *F. alnus*). The various species of *Frangula* may get confused in trade and can be distinguished histologically. *F. alnus* lacks sclereids and the medullary rays do not converge at the outer end, whereas *F. purshiana* does contain sclereids with medullary rays converging at the outer end (Youngken 1930).

Transverse section: Cork of numerous layers of rectangular cells filled with reddish brown contents; narrow phelloderm is composed of tangentially elongated cells with thickened tangential walls (resembling lamellar collenchyma); broad cortex contains large, yellow, usually round or elliptical groups of sclereids enclosed by a calcium oxalate prism sheath; sclereids are very heterogeneous in shape and size; occasional groups of irregularly arranged large, thin-walled cells occur (considerably larger than other cortex cells) that are precursors of sclereid groups; somewhat thin-walled and slightly pitted cortical parenchyma; calcium oxalate prisms and cluster crystals up to 25 µm diameter are abundant; mucilage-containing cavities are rare; secondary phloem with distinct medullary rays up to five cells broad, radially elongated cells, usually free of crystals; numerous rectangular groups of fibers, tangentially elongated and enclosed by calcium oxalate prism sheaths; fibers with narrow lumen; between medullary rays are tangentially aligned alternating groups of small and large parenchyma cells that are partly pitted; calcium oxalate prisms and cluster crystals are abundant; spheroidal groups of sclereids occur only in the outer part of the secondary phloem.

Starch: Scattered in all parenchymatous tissues in small amounts; granules are usually solitary, small, mostly <5 µm (up to 8 µm), irregular in shape.

Powder: Yellowish brown; groups of fibers with calcium oxalate prism sheaths; groups of yellow sclereids; parenchyma containing cluster crystals and calcium oxalate prisms; reddish brown fragments of cork. Fragments of moss and/or liverwort may be found in the powder because they are frequently found attached to the bark.



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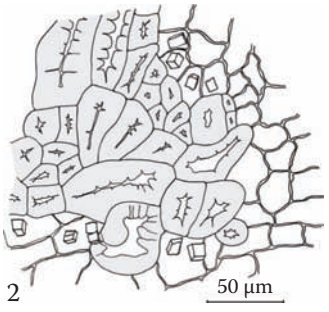

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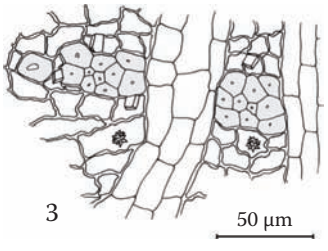

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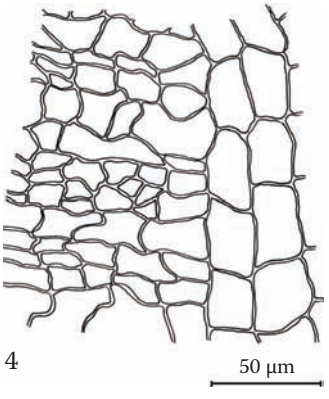

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