

Piper methysticum G. Forst.

Kava Rhizome and Root

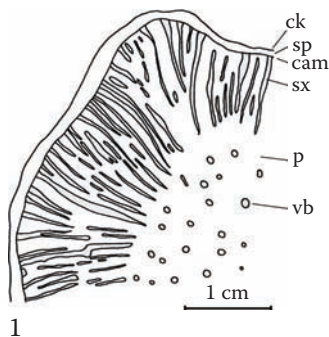
Piperis methystici Rhizoma et Radix

Piperaceae

The roots and rhizomes of kava have been used for centuries by peoples of the South Pacific—most prominently by those in Fiji and Samoa—for both beverage and ceremonial purposes. As a beverage, it is used as a general calmate as well as medicinally for the treatment of anxiety, a traditional use supported by modern clinical studies. Ceremonially, it is used in honoring guests, as a ceremonial offering to chiefs and dignitaries, and to foster harmonious cooperation in serious matters of discussion. Many varieties and qualities are traded. Concerns regarding the potential hepatotoxicity of kava have caused many nations to ban or severely restrict its use. The potential for stems to be mixed in with rhizomes and roots is most prominent. These plant parts are easily distinguished microscopically.

A. Rhizome

Transverse section: Thin-walled cork; narrow secondary phloem is parenchymatous with occasional pitted sclereids; secondary xylem has a distinctly radiate structure; large vessels, up to 120 μm diameter, are embedded in fibers and occur in small strands, alternating with parenchymatous medullary rays; in old roots and basal stems, the medullary rays may contain tangential bands of thickened pitted sclereids; large central pith with irregularly scattered collateral vascular bundles; throughout the parenchyma, some cells contain yellow-brown masses of oleoresins and most contain starch. Small calcium oxalate prisms may be present in all parenchymatic tissues.



Longitudinal section: Axially elongated, pitted sclereids in the secondary phloem; scalariform or bordered-pitted vessels.

B. Root

Transverse section: Thin-walled cork; in young roots, colorless or brown cortex with occasional pitted sclereids and endodermis is present; parenchymatous secondary phloem with occasional pitted sclereids; secondary xylem has a distinctly radiate structure; large vessels, up to 120 μm diameter, are embedded in fibers and occur in small strands, alternating with parenchymatous medullary rays that are terminated near the center by primary xylem; in old roots, medullary rays may contain tangential bands of thickened, pitted, lignified sclereids; small central pith; throughout the parenchyma, some cells contain yellow-brown masses of oleoresins and most contain starch. Small calcium oxalate prisms may be present in all parenchymatic tissues.

Longitudinal section: Axially elongated, pitted sclereids in the secondary phloem; scalariform or bordered-pitted vessels.

Starch: Simple or compound (two or three) granules more or less spherical, 10–20 μm diameter, punctate hilum (image 10); some grains look cleft or radiate (image 12); some grains have inconspicuous concentric striation.

Powder: Predominantly fragments of parenchyma with starch; many fragments of scalariform or bordered-pitted vessels and fibers; occasional sclereids.

