

Paullinia cupana Kunth

Guaraná Seed

Semen Guarana

Sapindaceae

Guaraná seed is native to tropical and subtropical America and was prepared as a stimulating beverage by the Guaranis of the Amazon Basin. The seed is rich in caffeine and its use as a stimulating coffee substitute has been popularized in the international market for decades. Guarana may be traded in its raw or processed form. The microscopic characterization provided was developed with the whole, unprocessed seed.

A. Testa

Surface view: Epidermal cells with very wavy and thickened anticlinal walls; yellow walls, black lumen.

Transverse section: Epidermis of elongated palisade-like cells, ~80–120 μm long, has a U- or an O-shaped cell wall thickening, with the outer and inner tangential walls remaining unthickened or only slightly thickened; these cells appear bright in polarized light; below the surface layer lie dark brown, tangentially elongated parenchyma cells with scattered sclereids (in surface view, these cells have a roundish lumen and the tissue appears as a complex three-dimensional structure of circular cells having broad cell walls, with vascular bundles embedded in the tissue); the innermost layer of the testa consists of slightly thickened and pitted cells; at the hilum, the testa is composed of several layers of isodiametric sclereids.



B. Embryo

Surface view: Epidermis of elongated thin-walled cells.

Transverse section: Epidermis of thin-walled cells; polygonal or roundish parenchyma cells with small intercellular spaces lie interior to the epidermis; cells close to the epidermis have yellow-brown walls and those further to the interior have colorless walls.

Starch: Abundant in the embryo; simple or two- or three-compound granules, individual granules are ~4–18 μm diameter, spheroidal or ovoid, with a punctate or radiate hilum.

Powder: Fragments of parenchyma from the embryo, partly with yellow cell walls; testa epidermis in surface view and transverse section; testa parenchyma in surface view; sclereids; abundant starch.

