

Formation and distribution of calcium crystals in the Trunk of *Hopea odorata*.

Abstract

Some of trees accumulate calcium crystals, which cause damage to cutting tools in wood machinery. For the fundamental information on the formation and distribution of calcium crystal in a trunk, *Hopea odorata* was very important to be studied. Three discs from lower, middle and upper positions of the trunk were collected. In each disk, radial strip from bark to pith was fixed with 3% glutaraldehyde. In each disc, small blocks from outer, middle, inner part and pith were cut and used for microscopic observation. Sections were stained with safranin and fast green. Morphology and distribution of calcium crystals in a trunk (radial and longitudinal) and quantitative analysis were carried out. Acid treatments with hydrochloric acid or acetic acid were also applied to investigate the chemical characteristic of the crystals. For comparison of morphology of calcium crystals between wood and bark, bark block was embedded in epoxy resin, and sections were stained with safranin. Crystals in wood were exclusively included in square/ upright ray cells with very rare cases of crystals in procumbent ray cells of ray parenchyma. Their morphology was prismatic crystals in wood and pith. In the bark, crystals showed druses form. Through chemical treatments, calcium crystals were identified as calcium oxalate. In the trunk, crystals were increased from outer to inner in the radial direction, but decreased in the pith. In the longitudinal direction, crystals showed an increase from lower to upper position in the outer and middle part, but decreased at inner part. Pith did not show much difference from lower to upper position of the trunk.

Keyword: Formation; Distribution; Calcium crystal; Calcium oxalate; *Hopea odorata*.