

## HISTOLOGICAL ANALYSIS OF COCOA SEEDS (*THEOBROMA CACAO* L.)

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The cocoa (*Theobroma cacao* L.) is experiencing a considerable appreciation in recent years from the nutritional point of view. In addition to its economic importance, the cardioprotective effect of flavonoids in cocoa powder and dark chocolate was confirmed (Keen *et al.*, 2005). To acquire, therefore, more information about the substances present in the various tissues of the seed of this species is of significant interest.

The aim of this research was the localization of macronutrients, such as lipids, proteins and carbohydrates in the different tissues/organs of the cocoa seed, by histochemical analysis and microscopic observations. The presence and localization of flavonoids were also investigated. Seeds were collected from a fresh fruit of cocoa and portions (2-3 mm of size) of the seed coat, endosperm, cotyledons and embryo were embedded in epoxy resin. In cyto-histological studies, semithin sections were stained with toluidine blue, while to localize macronutrients PAS staining and the osmium treatment were carried out.

Our studies confirmed that all portions of the mature seeds contribute to store macronutrients. In the teguments soluble polysaccharides were detected, in the endosperm the polysaccharides and lipids; polyphenols and polysaccharides were detected in the embryo axis and lastly polyphenols and polysaccharides in the cotyledons.

Keen C.L., Holt R.R., Oteiza P.I., Fraga C.G., Schmitz H.H., 2005. Cocoa antioxidants and cardiovascular health. *Am. J. Cl. Nutr.* 81: 298S-303S.

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