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Research Article

## Effect of cross-linking on the physicochemical, functional and digestibility properties of starch from Macho (*Musa paradisiaca* L.) and Roatan (*Musa sapientum* L.) banana varieties

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### Abstract

Starches from the Macho (*Musa paradisiaca* L.) and Roatan (*Musa sapientum* L.) banana varieties were chemically modified by sodium trimetaphosphate (STMP) cross-linking. Cross-linking affected the pasting properties of the modified starch, with more pronounced changes observed in the Macho variety than in the Roatan starch. In turn, this result indicated that the former starch source is more susceptible to STMP cross-linking. The swelling and solubility profiles exhibited an important decrease with cross-linking, which was caused by increased ordering of the internal granule structure induced by cross-linking modifications. The gelatinization temperature and enthalpy increased due to cross-linking, indicating an improvement in the starch granule stability. Englyst's in vitro digestibility studies of the modified starch were performed to estimate the content of rapidly digestible (RDS), slowly digestible (SDS) and resistant (RS) starch fractions. It was shown that STMP cross-linking increased the RS content of the two banana varieties. However, the SDS content increased only for the Macho variety. In general, the viscosity was lower for the