EFFECT OF BALL MILLING ON THERMAL, MORPHOLOGICAL AND STRUCTURAL PROPERTIES OF STARCHES FROM *Zingiber officinale* AND *Dioscorea sp*.

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ABSTRACT

Ginger and yam can be considered alternative sources of starch with specific properties, which can be modified through physical modifications, considered efficient and environmentally friendly. Thus, this study aimed to modify starches isolated from *Zingiber officinalle* and *Dioscorea* sp through ball milling at different times, verifying its effects on the thermal, morphological and structural properties. After milling treatment an increase in the thermal stability was observed for ginger and yam starches with the increase of milling time. A decrease in the gelatinisation parameters for two sources of the ball-milled starches was identified, which was related to the weakening of amylopectin chains and amylose depolymerisation. A decrease in the size of both starch granules was obtained, with the appearance of surface fissures. The degree of relative crystallinity decrease with the higher exposition to ball milling, reflecting in an amorphous state, although the diffraction pattern has not changed for both starches. Slight changes can be observed by Fourier transform infrared spectra due the damages caused by milling process.