Starch nanoparticles (St-NPs) were prepared using a non-conventional source of starch (*Cucurbita foetidissima*). *Cucurbita foetidissima*, is found in the central and southwestern part of the United States and northern of Mexico. The preparation was carried out by the anti-solvent nanoprecipitation method. Nanoprecipitation was selected due to its simplicity, speed and accuracy to produce both synthetic and natural polymeric nanoparticles. It allowed the preparation of fine particles with an improved control over particle properties, such as size, morphology and physical state. The structural, morphological and physicochemical properties of St-NPs were investigated using Fourier transform infrared spectroscopy (FTIR), X-Ray diffractometry (XRD), differential scanning calorimetry (DSC) and electron microscopy. The FTIR spectra allowed to demonstrated the change in the molecular structure after the nanoprecipitation of the source in study. The XDR allowed to see the changes in the crystalline structures, it was found that the structure of the St-NPs is amorphous after the nanoprecipitation. The thermograms recorded on the St-NPs showed a low gelatinization enthalpy. The St-NPs, may serve as an effective nanocarrier by coating and entrapping, protecting, and releasing hydrophobic bioactive compounds for functional food, pharmaceutical, and cosmetic industries.

**Keywords:** Starch nanoparticles, Nanoprecipitation, Cucurbita foetidissima

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