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Comparative study of the physicochemical, drug loading and releasing properties of cross-linked cassava, enset and potato starches

Solomon Abrha Bezabh
Mekelle University, Ethiopia

Cassava, enset and potato starches were modified by cross-linking in solid phase system, using sodium hexametaphosphate (SHMP) as cross-linking agent under different microwave power (90, 220 and 350 W) and reaction time ranging from 1 to 6 min to investigate and compare their physicochemical, drug loading and release properties. The swelling power, water holding capacity, paste clarity, degree of cross-linking (DC) and peak viscosity of the starches varied with starch sources as well as between the cross-linked starches and their native counterparts. Studies on drug loading capacity and encapsulation efficiency showed that cross-linked enset starch loaded higher amount of drug in 0.1 N HCl, 0.9% NaCl and pH 7.4 phosphate buffered saline (PBS) media as compared to cross-linked cassava and potato starches. After 12 h, cross-linked enset starch matrix released about 90% of the model drug, paracetamol, indicating their ability to sustain drug release and their potential to be used as drug-release-sustaining pharmaceutical excipient.

abrha.solomon13@gmail.com