Production of reducing sugars by Trichoderma sp. KUPM0001 during solid substrate fermentation of sago starch processing waste hampas

ABSTRACT

Trichoderma sp. KUPM0001 showed good growth during solid substrate fermentation (SSF)of sagopith residue known as hampas, supplemented with 10% (v/w) of mineral salts solution containing 0.5% (w/v) (83.3mM)urea as nitrogen source and an initial moisture content of 80% (v/w). Mycelium suspension of 10% (v/w) density was used as initial inoculum and SSF was carried out at 25±2°C in static condition over a period of 120h. The parameters optimized include the initial moisture content of the substrate, mineral salts solution, urea concentration, inoculum density, incubation temperature and incubation time. Without optimized condition, the maximum reducing sugar obtained was 24mg mL^{-1} compared to 46 mg mL^{-1} substrate during optimized SSF after 96h incubation. The optimum parameters obtained were 80% (v/w) of initial moisture; 10% (v/w) of inoculums size; 1.0% of urea in 20% (w/v) of mineral solution and incubated at 30±2°C. The enzyme activities using optimized condition gave maximum Ŭ-amylase, glucoamylase, carboxymethyl cellulase, filter paperase and ɓ-glucosidase of 3.19, 2.22, 1.66, 1.11 and 1.48 U mL^{-1}, respectively.

Keyword: Trichoderma sp. KUPM0001; Optimization; Solid substrate fermentation