Utilization of canteen food waste in lipid production by oleaginous yeast for biodiesel preparation
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Abstract: Food waste is a non-edible source of organic substances which consists the significant amount of carbohydrate. The mainly composed carbohydrate polymer especially starch can be hydrolyzed to release the fermentable sugar which are usable in fermentation. This research aims to utilize the canteen food waste hydrolysate as culture medium for growth and nutrient source for microbial lipid production. Dried canteen food waste was hydrolyzed by commercial enzymes (α-amylase and glucoamylase). The total reducing sugar was found to be 158 g/L when using 30% w/v of dried food waste with 10 u/g of α-amylase and 142.2 u/g of glucoamylase at 55°C for hydrolysis time of 2.48 h. In addition, the food waste hydrolysis was investigated for using as carbon source in lipid production of oleaginous yeasts. The growth of oleaginous yeast, Rhodotorula glutinis and lipid production in varied concentration of initial reducing sugar were carried out at 30°C with 160 rpm agitation for 168 h. The results showed that R. glutinis could be grown with cell dry weight about 3-12 g/L, and accumulated the lipid content of 5-20% of cell dry weight basis. The results presented canteen food waste as a promising carbon source for lipid production.

Keywords: Food waste; Rhodotorula glutinis; Lipid production