

Rapid screening method for isolation of glycerol-consuming bacteria for ethanol production

ABSTRACT

Large numbers of glycerol-consuming bacteria are present in nature; hence bioconversion of glycerol into biofuel which is bioethanol is one of the interests. The effective screening procedure is needed to screen and isolate broad ranges of bacteria from environment. The screening method was modified based on enzymatic oxidation of ethanol, which is correlated to reduction of 2,6-dichlorophenol-indophenol dye that resulted in the formation of yellow zone. Approximately 300 colonies were able to grow on minimal media using glycerol as sole carbon. Only about 70 isolates showed positive result when using the modified ethanol production assay after pre-screening stage. The formation of decolourized zone was apparent using modified assay containing 5 mL/L of 0.05M 2,6-dichlorophenol-indophenol, 10 mL of reaction mixture and 500 µl/L of enzyme, respectively. The ethanol production capability of the isolates was further proven by anaerobic fermentation as a quantitative method. This modified method is applicable in screening for ethanol producer from glycerol as carbon source allows rapid and more bacteria can be screened.

Keyword: 2,6-dichlorophenol-indophenol; Ethanol production; Glycerol-utilization; Screening and isolation