

Production of bioethanol from starchy tuber (*amorphophallus commutatus*) and antimicrobial activity study of its extracts

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ABSTRACT

Bio-fuels have been regaining popularity due to the rising price of oil, along with the growing concern about global warming caused by carbon dioxide emissions. Bio-fuels are processed from plant resources and are mostly made up of cellulose, which is one of the toughest materials. If cellulose can be turned into bio-fuel, it could be more efficient than other commercially available fuels starchy tuber. The of this study is on bio-ethanol production from starchy tuber. The comparative study was done between biological and chemical processes for the bio-ethanol production using *Amorphophallus* tubers. *Amorphophallus commutatus* species was selected because it shows higher starch content as per starch estimation. Tuber was collected in the lab and pre-treatment was given; followed by slurry was prepared and hydrolyzed by using fungal culture *Aspergillus* and *Trichoderma*. Three different conditions were maintained as two samples contain both fungal cultures, and one was having normal pH and temperature, and other was at normal temperature having pH 6, and third having only *Aspergillus* species and normal temp and pH. Hydrolysis was done by saccharification method. After hydrolysis sample is filtered and all three samples allows for fermentation process by using yeast (*Saccharomyces cerevisiae*) process is carried out for 12 to 15 days after fermentation the fermented sample was distilled by Soxlet Extraction method and lastly the sample was estimated for alcohol estimation by using specific gravity method. Two samples showed 11% alcohol content and third one shows 12% content when compared with alcoholometry table. Antimicrobial activity was also studied by using three extracts such as before hydrolysis, after hydrolysis and after fermentation against four types of organism's two species *Salmonella* and *S. aureus* shows positive result while *E. coli* and *Serratia* sp. showed negative result. Results indicate that chemical process more productive compared to biological process. However, biological process is eco-friendly. It is also cost-effective. It can be produced on large scale for production of bio-ethanol.

KEYWORDS

Alcoholometry; Bio-fuel; Hydrolysis; Fermentation

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