

COMPARISON OF BIOETHANOL YIELD PRODUCED FROM *MORINGA OLEIFERA* SEEDS HUSK REMOVED MANUALLY AND MECHANICALLY

Eman N Ali, Mohamad Syazwan Bin Abdul Halim

Faculty of Chemical & Natural Resources Engineering,

University Malaysia Pahang, Tun Razak Highway, 26300 Kuantan, Pahang, MALAYSIA.

eman@ump.edu.my

ABSTRACT

Moringa oleifera is a plant which benefits to mankind from its root until leaves. In this research, the seeds husk of *Moringa oleifera* were used to compare the bioethanol yield produced from seeds husk removed manually and mechanically. About 30g of *Moringa oleifera* seeds husk was used for each sample and 450 ml of water was added. Pre-treatment was started by adding NaOH up to pH of 11-12. The samples then left for 24 hours, and the pH was adjusted to 4.5, 5, and 5.5 using 0.5M H₂SO₄. The samples were located at autoclave for 2 hours at 120°C. The samples collected from autoclave are left to be cold at room temperature. Then, the *Saccharomyces cerevisiae* (Baker's yeast) was added with different dose of 1g, 5 g, and 10 g in a closed conical flask at temperature of 32°C and located at shaking incubator with agitation rate of 200 rpm for 72 hours. On a 12 hour basis, the samples were collected and tested using HPLC to determine the bioethanol yield. The results showed that the concentration of bioethanol produced from *Moringa oleifera* seeds husk that is removed mechanically is higher than that removed manually with a concentration of 15.5058 gm/L and 13.4365 gm/L, respectively. As a conclusion, both method results the best yields at same fermentation time of 12 hours. Therefore, it can be concluded that both methods are good in producing bioethanol with the same concentration, and it is better to use the mechanical method because the manual method is very tough and time consuming which make it not economical.

Key words: *Moringa oleifera*, seeds husk, fermentation, bioethanol, hydrolysis.

Introduction:

In view of continuously rising petroleum costs and dependence upon fossil fuel resources, considerable attention has been focused on alternative energy resources. Production of ethanol or ethyl alcohol (CH₃CH₂OH) from biomass is one way to reduce both, the consumption of crude oil and environmental pollution (Lang et al., 2001). Primary consideration involves the production of ethyl alcohol from renewable resources and determination of the economic and technical feasibility of using alcohol as an automotive fuel blended with gasoline (Goldstein, 1981). Ethanol represents an important, renewable liquid fuel for motor vehicles. The use of gasohol (ethanol and gasoline mixture) as an alternative motor fuel has been steadily increasing around the world for a number of reasons. Domestic production and use of ethanol for fuel can decrease dependence on foreign oil, reduce trade deficits, create jobs in rural areas, reduce air

