

## FERMENTED PRODUCTION OF ALCOHOL BY USING MAIZE AND GUINEA STEM AND MICROORGANISM SACCHAROMYCES CEREVISIAE

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### ABSTARCT

*At present day we are facing a problem of fuel shortage. Near about 70% fuel contained alcohol to avoid shortage we have to find out alternative method of alcohol production. Besides that, the bio fuels are obtained from green biomass can also represent the promising type of energy source. Alcohol one of fermented product prepare by fermented techniques. The whole investigation done on the basis of fermentation process Fermentation is the technique in the development of new products by changing the biochemical composition developed new product such quality like flavor and nutritional compounds. Biomass is nothing but source of carbohydrate and sugar, starch it can fulfill by plant material. Plant material such Maize stem (Zeamays), Guinea stem (Megathyrusmaximus) use as raw material. Saccharomyces cerevisiae is microorganism use as key role in fermentation. First we have to do collection of raw material then we have to prepare of juice of raw material. Then microorganism like yeast is added which run there life cycle during which metabolism process perform which start convert carbohydrate into alcoholic content. the result of fermentation is observed by the different parameter such as such color, ph range, smell that are some parameter tells that fermentation is completed and alcohol is prepared.*

**KEYWORDS:** *Maize Stem, Guinea Stem, Fermentation, Alcohol*

### INTRODUCTION

Now days the fuels are used in more quantity due to that one day we have to face the problem of shortage of fuel. This shortage is not for one country it should worldwide problem. So that we should have to find some alternative fuel source. Generally we use fossil fuel that use vehicle after combustion carbon monoxide gas will more amount nature release that lead to increase of the greenhouse gases. we have also face the problem like global warming. We people now days turns to destroying forest and make them a urbanized that leads to deforestation (Seungdo Kim2004). Then means such problem find out the alternative fuel source with help different techniques and different. Therefore it is necessary to find source of renewable energy, tidal energy, biomass energy. The most fuel contains alcohol and alcoholic drink that contained ethanol. These are classified beers, wine, rum, vodka and other contained used as spirit fuel. There are different authors literature are recorded that the stalk juice was extracted from sorghum and they are subjected to yeast (*Saccharomyces cerevisiae*) for the fermentation. (Muhammad Nasidi 2013). The one source is fossil fuel while another source is biomass such as starch, sugar, and cellulose material from that alternative biomass are prepared (Zanin GM 2000).All earlier study revealed that biomass ethanol production is cheaper and

suitable which can be derived from grass, wooden shavings and bagasse, nonfood source is used as perfect feedstock for ethanol production (Goldemberg J 2007).

Sugarcane is a plant key content carbohydrate so that it used as ethanol is an alcohol based fuel produced by the fermentation of sugarcane juice and molasses. Sugarcane ethanol for its price and environmental benefits making gasoline the alternative fuel in the country. There are different types of crop are used as energy crop such plant are cultivated for the purpose of raw material for ethanol production for eg grasses and special monocot plants which are faster growth rate that used to gain energy. Some grasses are used as energy crops due their high productivity per hectares, abundant, available, and every part will be useful. Such also characterize by the fibers and store the carbohydrate and high amount of protein and nitrogenous waste component Both cellulose and hemicelluloses from the some grasses such as *Arenga Pinnata* Merr belongs to family *Arecaceae*. *Arenga pinnata* palm has been reported to have ethanol yields ranging from 6480 to 20,000 liters/ha, which make it several times more productive than the sugarcane. Ethanol production in Brazil is done during a continuous sugar cane harvest season of 200–230 days. These industrial processes are based on large-scale fermentations of sugar cane juice, molasses or a mix of both in different proportions (Amorim H.V.2005)

Fermentation is one biochemical modification activity by using microorganism under anaerobic condition. the basic fermentation process run with glucose and end with alcohol production Alcohol one of fermented product prepared by fermented techniques. The whole investigation done on the basis of fermentation process Fermentation is the technique in the development of new products by changing the biochemical composition developed new product such quality like flavor and nutritional compounds. Biomass is nothing but source of carbohydrate and sugar, starch it can fulfill by plant material. Plant material such Maize stem (*Zeamays*), Guinea stem (*Megathyrsus maximus*) use as raw material. It is the techniques are useful to developed new product by some mechanism under certain condition by the fermentation different useful product are prepared such as cured by milk and starch and glucose by ethanol alcohol product. These products having modified physiochemical character such as quality flavors nutritional compound with help of fermentation different chemical are prepared such as Alcohol, Acetic acid, lactic acid and their quality product will developed. In that alcohol fermentation is widely beverage in which alcohol major constituents Fermented product mostly beverages are prepared by fermentation from memorable time. Grasses are consider one of the most suitable energy after use it can be regenerate it can be withstand drought condition There are many famous grasses are locally grown which is known as fodder. Such grasses having fast growth minimum life cycle any season. It can available any place such grasses is belongs from monocot. Monocot having key character such Fiber yielding crop. Ethanol production is done by from cellulose and hemicelluloses hydrolysis to sugar by acid and some enzyme use as catalyst (Muhammad Kismurtono 2012). The Nigerian government has run the programmed Bio fuel policy statement research proposal at 2007 aspire to achieve self sufficiency in bio ethanol supply domestically can done. Sorghum is another type of crop is potential feedstock source of bio ethanol production from it and used as yeast (*Saccharomyces cerevisiae*) (Ishola M.M2013). *Saccharomyces cerevisiae* are widely known organisms that can utilize glucose and xylems for ethanol fermentation technology. In world India is fourth largest ethanol producer after Brazil, United state and China So that we should have to developed alternative methodology to production of alcohol that is one of alternative methods by the fermentation of juice Monocot cellulose fiber yielding crops

## **MATERIALS AND METHODS**

Fermentation biotechnological one bacterial metabolism process for that we require some ideal micro organism like Yeast (*Saccharomyces cerevisiae*.) Then we need a plant material that use as for raw material should contained high amount of carbohydrate so that we take Maize stem juice (*Zeamays*) is a member of the grass family Phocaea. It is a cereal grain, Guinea stem juice (*Mega thyrus maximums*) s a species of flowering plant in the family Balsaminaceae. For entire we use different types of instruments such as Electronic Balance. pH paper or universal indicator solution. Glassware:-Conical flask, Beaker, stirrer, funnel, a stopper bottle for fermentation. Muslin cloth use for filtration Oven: For pasteurization process.

## **METHODS**

### **Production of Alcohol Requires a Following Processes**

- **Juicing**

The collection of raw material from the farmer fields. Then juicing is done through different techniques such as crushing In this process in juice is extracted from stems of our raw material maize and guinea grasses. Select the fresh and healthy plant which having high growth, wash with tap water then clean the fermentation bottle, and remove the unwanted part from stem and crush with the hands and add distilled water.

- **Autoclaving**

When after collection of raw material juice are preparing it should be autoclave It is the process of sterilization of juice in which the juice of maize and guinea stem is autoclaved at 15-20 min at 121<sup>0</sup>C.

- **Fermentation**

It is one of technique which change the biochemical composition of material., fermentation process required 10 – 15days. Fermentation is the anaerobic pathway which is run by using microorganism like yeast. In which complex material broken down simple ethanol and carbon dioxide. The basic fermentation process run with glucose and end with alcohol production The process run two steps first is known as glycol sis which convert of glucose into the private molecule and from private it convert into alcohol

- **pH Measurement**

The Ph measurement is done for to determine the acidity and basically the scale is from 0–14 if we value 0–7 then chemical is acidic while if the 7–14 it is basic nature if the ph value is 7 the solution is neutral. pH stands for the negative logarithm of the hydrogen ion concentration in water. If there is no water, there is no negative hydrogen ion concentration. If you have a mixture of alcohol and water, an aqueous solution, then you can determine the pH with a pH meter or pH paper. After adding yeast in the juices, mixture kept for fermentation process for 15 days. After the 15 days mixture shows changes in it. After the measuring of pH of that mixture it is confirmed that alcohol is present in the mixture ie. Juice.

- **Filtration**

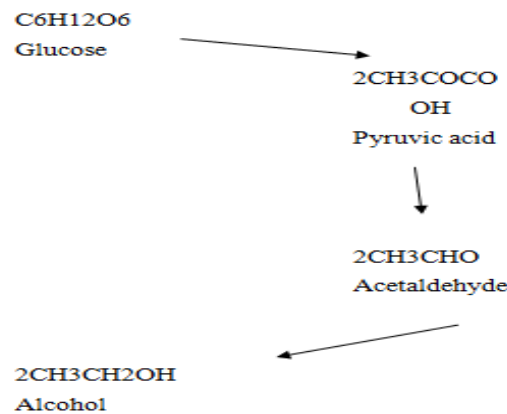
After 3 days fermentation process will complete then we have solid particle in that juice mixture for that we do filtration process by what man filter paper. Now it's ready to further process

- **Pasteurization**

The fermented product should be pasteurized to maintain the quality and beneficial for the health it can be pasteurized at 80°C for 20 minutes.

- **Bottling and Storing Alcohol**

When the alcohol is ready then it stabilizes for the cold treatment. The filtered wine is then packed in bottles, which are washed internally and externally with double filtered water to remove bacteria and germs. For the storage it should we have some condition. Temperature which does not have rapid fluctuation. 55 degrees Fahrenheit is a good.



**Figure 1: Alcohol Production Mechanism.**

## RESULTS AND DISCUSSIONS

The production of ethanol from the Maize and Guinea stem juices in anaerobic condition by adding the yeast the fermentation is occurs within 15–20days. The ethanol is produced with a strong smell after the end of fermentation process. The Ph value of pure alcohol is 5.5. The Ph range, Table 1 tells that ph range wills from juice to ferment product it will be decreases this indicates the fermentation product show presence of ethanol. As we discuss ph range indicate fermentation process completing status as we say some other parameter also considering such odor of fermented product is similar to the alcoholic product then another qualitative parameter is when we early juice is prepare then color is green brownish after 15 days color changes light brown, after 30 days it is more light in color after pasteurizing it become white color

The change in ph are explain in Figure 2 the initial number of day juice extract ph will high then number of days increases with increasing ph that is the first juice is prepare ph is 6.5 then after 15 days ph will be 5.5 that indication of fermentation process will be start and day by day it will be decreases that become final 3.8 that exact ph of alcoholic product hence our alcohol is prepared

**Table 1:Observation Table**

Sr No	Sample (Day)	Observation	Ph Value
1	Sample of fermented product	Brown color	6.5
2	Day First to 15	Light Brown Color	5.5
3	Fermented product 16–30	Light color	4.5
4	Pasteurize the fermented product	White color	4.0
5	Adding the Sodium Metabisulfite	Completely white color appear	3.8

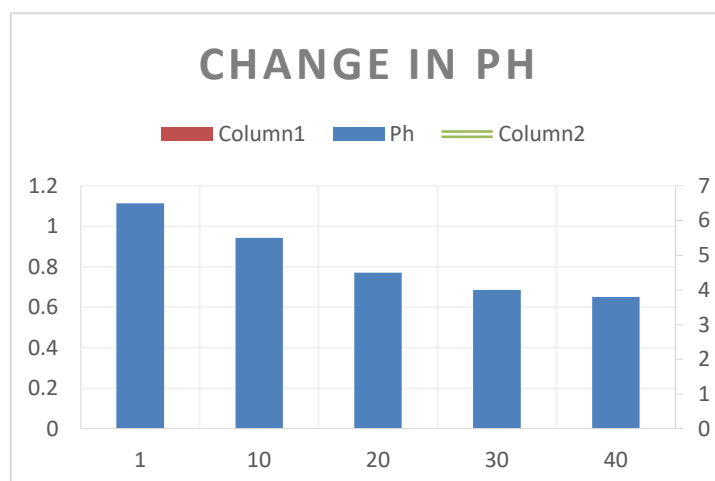


Figure 2: Change in Ph Value in References with Time.

## CONCLUSIONS

The result of Experiment is alcohol production is done by fermentation technology yeast and maize guinea juice with sequence of day is done. It can concluded by the Ph range value sugar solution having high that ph will be reduce day by day Another conclusion able point is the smell and odor is like alcohol that can also concluded it is alcohol. The ethanol production is done from the starchy material like potato; sugar cane is also used for the obtaining ethanol. Ethanol is used energetic material used as a fuel. Ethanol is used for the production of various products of food. The progress is the easily but large amount of production is costly project but profitable of the project or production. In now day's industry different types of fermentation process run such as free fermentable sugar to ethanol production is most costly production that's alternative option is the alcohol production from juice of grassed? It is economical beneficial. Thus alcohol production is an important fermentation because of following reasons-Gives ethyl alcohol used for consumption as well as industrial purpose. Gives by products like carbon dioxide, yeast biomass, fertilizer etc.

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