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Successful production of Bioethanol from *Canna Indica*

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Abstract— Canna *Indica* is common flower throughout the tropical region of India.It contains sugar rich liquid that is nector, which can be converted to Bioethanol. Commercially available active dry yeast can be use as a source of S.cereviciae. In this investigation attempt was made to estimate sugar concentration by DNSA method and Estimation of ethanol by potassium dichromate oxidation method. Sugar concentration of flowers was found to be 3.6 mg/ml.Alcohol concentration was found to be 4.8 mg/ml.

Index Terms— Thevatia peruviana, Bioethanol

I. INTRODUCTION

Currently Bioethanol production mainly depends on molasses. However the availability of molasses depends on cane and sugar production that is cyclical in nature. This will lead to a rising pressure on molasses availability and thus may cause a drastic price hike. (G. Basavaraj 2013)

Various ethanol producing micro-organisms yeast belonging to S. cerevisiae has been used most commonly in fermentation where yeast was found to be more ethanol tolerant and produced more ethanol at sugar concentration above 15 % (v/v). (Emad Y. Moawad 2012)

Canna Indica perennial herb with tuberous root stock; bears small but vivid red and yellow flowers.Found almost everywhere constantly in blossom. Canna Indica contains sugar rich liquid.

II. MATERIAL AND METHODS

Collection of flowers

Flowers of Canna *Indica* was collected from local sites of Ratnagiri, Maharashtra, India.

Extraction of flower juice

All flowers were washed thoughrly with distilled water. Flowers were crushed with mixer grinder. And juice was extracted with muslin cloth. Filtrate was used for preparation of fermentation media.

Preparation of fermentation media

Extracted flower juice was sterilized at 121°c and 15 psi pressure for 20 min. After cooling $(NH_4)_2SO_4$ was added to slurry as nitrogen source and pH was adjusted to 5.5 for fermentation by yeast *S.cereviciae.*

Inoculum development

Commercial active dry yeast (ADY) was used as a source of yeast *S.cerevisiae*. For inoculums development Yeast Extract-Peptone-Dextrose media (Yeast Extract, 10 g/L; Peptone, 20 g/L; Dextrose, 20 g/L; pH 6.5 ± 0.2) was used. The overnight grown culture of *S.cerevisiae* was used as inoculums.

Fermentation

For fermentation assembly 100 ml of prepared media was taken in 250ml of conical flask. 1ml of inoculum was added. Whole setup was kept at room temperature for 8 days.

Sugar and ethanol estimation was done for every respective day.

Sugar estimation

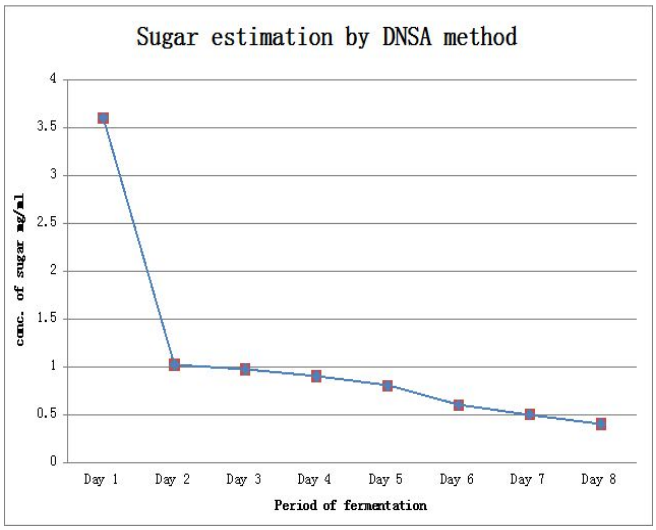
The estimation of flower juice was done by DNSA (Dinitrosalicylic acid) method .

Alcohol estimation

Fermented broth was subjected to distillation process. The alcohol content from distilate was estimated by potassium dichromate oxidation method.

III. RESULT AND DISCUSSION

Various substrates are in use for ethanol production. As many of them are food products. Variety of flowers contains sugar rich liquid, which can be used for ethanol production. Canna *Indica* contain about 3.6 mg/ml of sugar. Sugar content was decreased to 1.02, 0.97, 0.9, 0.8, 0.6, 0.5, and 0.4 mg/ml at 2nd, 3rd, 4th, 5th, 6th, 7th, 8th days respectively.



Graph: Sugar estimation by DNSA method

After completion of fermentation ethanol was estimated by potassium dichromate oxidation method, and was found to be 4.8 mg/ml.

IV. REFERENCES

1. A.Potphode, S.Agarwal, "Bioethanol Production from Flowers of Quisqualis indica", International Journal of Science, Engineering and Technology Research (IJSETR) Volume 4, Issue 4, April 2015.

2. G. Basavaraj, P. Rao, K. Basu, C. Reddy, A. Kumar, , B.V.S. Reddy(2013), 'Assessing Viability Of Bio-Ethanol Production From Sweet Sorghum In India' DOI;http://dx.doi.org/10.1016/j.enpol.2013.01.012

3. Emad Y. Moawad (2012), 'Optimizing bioethanol production by regulating yeast growth energy' Syst Synth Biol (2012) 6:61–68 DOI 10.1007/s11693-012-9099-6

4. Mandal P and kathale N, 'production of ethanol from mahua flower (madhuca latifolia l.) Using saccharomyces cerevisiae' – 3044 and study of parameters while fermentation, volume no.1, issue no.9.

5. Nutawan Y, Phattayawadee P., Pattranit T. and Mohammad N. (2010) , 'Bioethanol Production from Rice Straw', Energy Research Journal 1 (1): 26-31, 2010 ISSN 1949-0151 © 2010 Science Publications

6. Behera S,Ramesh C Ray and Rama C Mohanty(2010),'Comparative study of bioethanol production from mahula (Madhuca latifolia L)flowers by immobilized cells of Saccharomyces cerevisiae and Zymomonas mobilis in calcium alginate beads.'journal of scientific and industrial research,vol.69,June 2013.pp.472-475.