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EXTRACTION AND ISOLATION OF CARROT GRASS FOR PROTECTION OF ENVIRONMENT

Snehlata Hada*¹ & Ashutosh Shukla²

¹Department of Chemical Sciences Christian Eminent College Indore (M.P.), India.

²Department of Chemistry, SVVV, Indore (M.P.), India

ABSTRACT

Parthenium hysterophorus (carrot Grass) refer to Lignocellulosic biomass .Expansion of sustainable energy systems based on renewable biomass feedstock's is now a global effort. Lignocellulosic biomass contains polymers of cellulose, hemicellulose, and lignin, bound together in a complex structure. Ethanol can be made from biomass via fermentation of sugars derived from the cellulose and hemicelluloses within lignocelluloses materials, but the biomass must be subjected to pretreatment processes to liberate the sugars needed for fermentation. Lignocelluloses refer to plant dry stuff (biomass). It is the most abundantly available raw material on the Earth for the production of bio-ethanol. It is composed of carbohydrate polymers (cellulose, hemicelluloses), and an aromatic polymer (lignin). These carbohydrate polymers contain various sugar monomers (six and five carbon sugars) and they are tightly bound to lignin.

Parthenium hysterophorus is an annual herb that uncompromisingly colonizes disturbed sites. Inhabitant to southern United States, Mexico and Central and South America, it has been by accident introduced into several countries and has become a serious agricultural weed in parts of Australia, Asia, Africa and the Pacific Islands, also India. It grows on any type of earth and in a wide range of habitats. It affects the production of crops, animals, human and animal health, and biodiversity. *P. hysterophorus* being Lignocellulosic mass can be utilize as a potential for the production of ethanol and then ethylene.

Keywords: *Parthenium hysterophorus*, Polymers, Ethanol, Ethylene.

I. INTRODUCTION

Lignocellulose—a major constituent of biomass is accessible on earth ,is a renewable and in large quantities available with great potential for bioconversion to value-added bio-products. General name of *Parthenium hysterophorus* L. Is carrot weed; chatak chandani; gazar ghas; osadi *P. hysterophorus* is an upright, much-branched with strong development tendency, fragrant, yearly (or a short-Lived perennial), herbaceous plant with a deep taproot. The species reproduces by seed. This Lignocellulosic biomass, can be fermented to ethanol. Biomass is a carbon-neutral source of energy: as it comes from plant life, the incineration of lignocellulosic ethanol produces no net carbon dioxide into the earth's atmosphere. *P. hysterophorus* being Lignocellulosic mass can be utilize as a potential for the production of ethanol and then ethylene.

II. MATERIALS AND METHOD

Ethanol production technologies

To obtain Bio ethanol following steps is proposed:

Preparation of row material → Pretreatment of row Material → Saccharification of Pretreated Substance → fermentation of sugar to alcohol → product separation/ distillation.

Raw Material Preparation

Carrot grass was obtained from the field of agriculture college, Indore. It was air dried and chopped into small size (2–5 cm), and was stored in an airtight polyethylene bag at room temperature for further use.

Pretreatment of raw material

Pretreatment is required to modify the biomass structure so that hydrolysis of carbohydrate portion to monomeric sugars can be achieved more quickly and with superior yields (Sun and Cheng, 2002; Moiser et al., 2005). Pretreatment affects the structure of biomass by solubilizing hemicelluloses, dropping crystallinity and raise the accessible surface area and pore volume of the substrate.

Alkali pretreatment

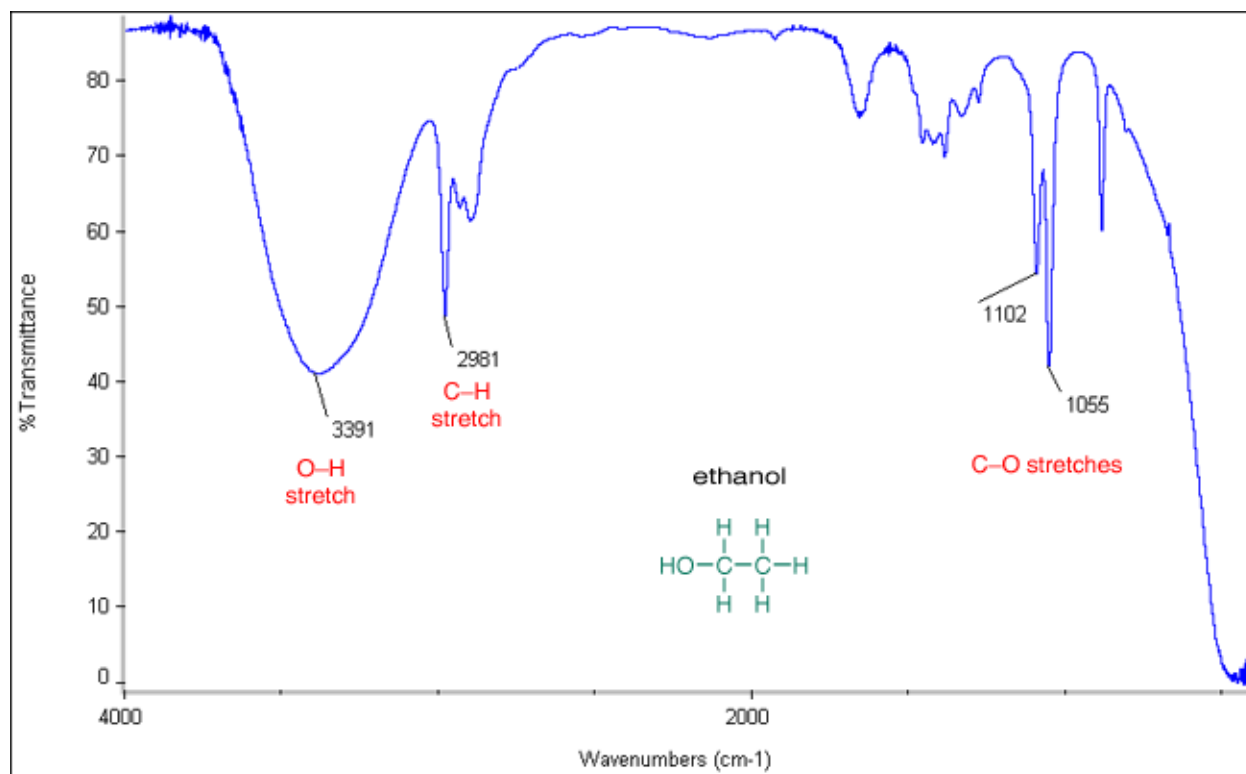
Alkali pretreatment involves the adding of bases to biomass, leading to an boost up inside surface by swelling, a decrease of polymerization degree and crystallinity, destruction of links among lignin and other polymers, and lignin breakdown (Badiel et al. 2014) NaOH or KOH are most reported chemicals used in alkaline pretreatment, in this process conditions are relatively mild but reaction times can be long (Harmsen et al. 2010).

Saccharification of Pretreated Substance

After hydrolyzing, enzyme yeast was added to the mixture, and was left for 40 days. After fermentation, mixture was filtered and the filtrate is subjected to distillation .The distillate is Checked for the presence of ethanol.

III. RESULTS AND DISCUSSION

The filtrate is subjected to infrared spectroscopic analysis. The result confirms the presence of ethanol in the sample. IR of the ethanol is as under.



Catalytic Dehydration of Ethanol to Ethylene

Catalytic dehydration of ethanol is an alternative route for production of ethylene. The first report on catalytic dehydration of ethanol to ethylene was published in the literature in 1797 [73]. However, the first commercial plant was started in the beginning of the 20th century. In the industry, the alcohol dehydration mainly occurs in the vapor phase of two-catalyst systems, i.e., supported phosphoric acid and activated alumina. Most old technologies used

phosphoric acid while the activated alumina became predominant later [10]. The ethanol dehydration is an endothermic reaction (requiring 1632 J g⁻¹ or 390 cal g⁻¹ of ethylene formed).

IV. CONCLUSION

Lignocellulosic biomass like *Parthenium hysterophorus* could be a good source of ethanol that could be used for further production of bioethelene. This then polymerizes to polythene. By the production of biopolythene ,environment could be protected ,as it eradicate the harmful carrot grass from farmer field as well as easily decomposed to save soil fertility thus help in sustainable development.

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