

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
**Belgaum – 590010**



**PROJECT REPORT ON**  
**(06CH85)**

**“PRODUCTION OF ETHANOL FROM CALLIANDRA  
CALOTHYRSUS”**  
**(Sponsored by K.S.C.S.T)**

*Submitted in partial fulfillment of the requirements for the award of the degree*

**BACHELOR OF ENGINEERING**  
**IN**  
**CHEMICAL ENGINEERING**

**HEAD OF THE DEPARTMENT**  
**Dr.S.SHANMUKHAPPA**  
Ph.D

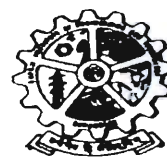
**PRINCIPAL**  
**Dr.B.T.ACHYUTHA**  
B.Sc. B.E, M.Tech. Ph.D, F.L.E, M.I.S.T.E

**PROJECT GUIDE**  
**Dr.S.SHANMUKHAPPA**  
Ph.D.

**PROJECT ASSOCIATES**

**VIJAYASHREE. S.D**  
**LALITHAMBIKA**  
**NITIN KUMAR**

**4BD05CH027**  
**4BD06CH003**  
**4BD06CH006**



**(2009 -2010)**

**DEPARTMENT OF CHEMICAL ENGINEERING,**  
**BAPUJI INSTITUTE OF ENGINEERING AND TECHNOLOGY,**  
**DAVANGERE-577004, KARNATAKA, INDIA**

## **ABSTRACT**

Recent Govt. of India notification for mandatory marketing of minimum 5% alcohol blended gasoline, necessitated for availability of 10 millions tones (M.T) of alcohol per annum from petroleum industry alone. Product of such a large quantity of ethanol from any food chain source is not feasible and economically viable. The only option left out is to adopt lingo-cellulosic sources, as they are abundant wide spread, non food variety and are economic at present

Production of alcohols from such lingo-cellulosic items is a two stage process. Acid/Alkaline type of hydrolysis of cellulose to glucose in the first stage and fermentation of glucose to alcohol are carried out in the second stage. Selection of appropriate kind of lingo-cellulosic item, micro-organism and optimum process conditions employed, govern the overall economics of the process

*Caliandra Calothyrsus* which belongs to species *Racemosae* is chosen for ethanol production studies, as it is fast growing, co-existing and native plant. Plant does not demand any agricultural land and readily yields upto 15 metric tones of tender stems suitable for ethanol production. Stems of plant consists of alpha-cellulose (15-18%) rich source of proteins and least amount of lignin(6-8%) which are desirable for microbial fermentation operation. Preliminary fermentation studies carried out in the laboratory with *Bacillus Asperigillus* microbe have produced about 6% alcohol, there by necessitating a detailed investigation for possible commercialisation.

The present study aims at (i) evaluation of technical feasibility of *Caliandra Calothyrsus* plant for ethanol production, and (i) to arrive at optimal conditions required for maximum yields of alcohol.