



**Review Paper**

## **Review on Production of Ethanol from *Bassia Latifolia***

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### **Abstract**

*The forest and non-forest area have wonderful multiple utility tree of *Bassia Latifolia*. It is large tree occurring in deciduous and moist deciduous forest of India. It is also known as *Madhuca Indica*. The tree gives flowers which are fermented and distilled to produce liquor. It is used by the local tribal people for all festive occasion besides daily consumption. The dried flowers are also consumed as food by mixing it with flour and baking bread. The flowers are sweet and have glucose and sucrose. Ethanol has attracted considerable attentions as a motor fuels to the success of the Brazilian proalcohol program initiated in 1975 as a response to the global oil crisis of the 1970. despite the technical successes of this program around one third of Brazil 12 million cars are powered by ethanol fuel the high cost of producing has required large direct and indirect subsidies amounting to over US \$1.00 billion per annum in one of the two forms 95% mixture with water known as hydrous or hydrated ethanol and a 99.5 % mixture with benzene known as anhydrous or absolute ethanol fuel grade ethanes as produced in Brazil is manufactured by distillation. Generally, ethanol produced from fermented feed stock as sorghum, citrus molasses, corn, sugarcane. But *Bassia Latifolia* flower an important new source of ethanol production and so many other by products. The characteristic of ethanes as motor vehicle fuels are contrasted with those of conventional gasoline's and diesel fuels. The implication of physical and chemical differences of these fuels for motor vehicle design and emissions are discussed. A number of possible air quality impacts are examined including changes in ozone, carbon monoxide, oxides of nitrogen, particulate matter, and toxic compounds. Recent government actions have also encouraged the productions and use of alcohols as fuels.*

**Keywords:** Ethanol, *bassia latifolia*, flowers, air quality.

### **Introduction**

The rapid depletion of petroleum reserves and rising of oil prices have led to the search for alternative fuels<sup>1</sup>. Investigations have been carried out on a variety of alternative fuels like ethanol, methanol, vegetable oil, jatropha oil, karanja oil, rapessed oil. Efficient use of natural resources is one of the fundamental requirements for any country to become self sustainable<sup>2</sup>. Both in organized and unorganized sectors. Internal combustion engines have become an indispensable prime move. Fast depletion of a fossile fuels is demanding an urgent need to carry out research to find viable alternative fuels. Thermodynamic test based on engine performance evaluations have established the feasibility of using a variety of alternative fuels such as hydrogen, CNG, biogas, etc. To cut foreign exchequer and contribute towards protection of earth from the threat of environment degradation<sup>2</sup>, alcohols can be used directly while others need to be formulated to bring the relevant properties close to conventional fuels.

Ethanol has attracted considerable attentions as a motor fuels to the success of the Brazilian proalcohol program initiated in 1975 as a response to the global oil crisis of the 1970<sup>3</sup>. despite the technical successes of this program around one third of Brazil 12 million cars are powered by ethanol fuel the high cost

of producing has required large direct and indirect subsidies amounting to over US \$1.00 billion per annum in one of the two forms 95% mixture with water known as hydrous or hydrated ethanol and a 99.5 % mixture with benzene known as anhydrous or absolute ethanol fuel grade ethanes as produced in Brazil is manufactured by distillation<sup>4</sup>. Generally, ethanol produced from fermented feed stock as sorghum, citrus molasses, corn, sugarcane. But *Bassia Latifolia* flower an important new source of ethanol production<sup>5</sup>.

The characteristic of ethanes as motor vehicle fuels are contrasted with those of conventional gasolines and diesel fuels. The implication of physical and chemical differences of these fuels for motor vehicle design and emissions are discussed. A number of possible air quality impacts are examined including changes in ozone, carbon monoxide, oxides of nitrogen, particulate matter, and toxic compounds. Recent government actions have also encouraged the productions and use of alcohols as fuels<sup>6</sup>.

### ***Bassia Lattifolia* Flowers**

The forest and non forest area have wonderful multiple utility tree of *Bassia*. It is large tree occurring in deciduous and moist deciduous forest of India<sup>6</sup>. Its earlier name was *Madhuca Indica*.

The tree gives flowers which are fermented and distilled to produce liquor. It is used by the local tribal people for all festive occasion besides daily consumption. The dried flowers are also consumed as food by mixing it with flour and baking bread. The flowers are sweet and have glucose and sucrose.

The flowers are also good cattie feed when mixed with other feed. The seeds give oil which has excellent saponification quality and is used by soap manufacturer. It is also used as a cooking media by the local people. The flowers are seed collections gives lot of employment to the people<sup>7</sup>. The timber is also hard and storing timber and can be seen as beams in the houses which are as old as 80-100 years<sup>8</sup>.

Uses of Bassia Latifolla Flowers: i. Leaves are used to prepare Bide and plates, ii. Flowers are given in cough, iii. Flowers are use for preparations of liquor, iv. Liquor is use for treatment of internal pains, v. Seed oils use for preparation of soap, vi. Leaves are use as folder, vii. Flowers are use for production of ethanol, viii. It is use production, ix. Wood can use as furniture; x. Seed Oil can be use as biodiesel.

Production of Ethanol from Bassia Latifolla Flowers: Production of ethanol from bassia latifolla flowers Plant consists of furnace, boiler, and condenser. The construction of plant is simple as compare to gasoline or other ethanol producing plant.

Brazil uses sugarcane as primary feedstock for production of ethanol. United States uses sorghum, corn, or citrus molasses for production of ethanol<sup>9</sup>. In our country sugar factories produces ethanol from molasses of sugarcane<sup>10</sup>.

Production of ethanol from Bassia Latifolla flowers can be done by fermentation of Bassia latifolla flowers. Fermented Bassia latifolla flowers fill in the boiler. Any type of fuel can be use for supplying the heat to boiler. Because small quantity of heat required to vaporize the ethanol from fermented Bassia latifolla flowers. Supply the heat to the boiler up to temperature of 78<sup>0</sup>C. Due to heating at 78<sup>0</sup>C ethanol will vaporized and collected above the surface of heated fermented flowers. Ethanol vapor from boiler supply to condenser when it passes through condenser it get condense by transferring its latent heat to cooling water<sup>12</sup>. Condensed ethanol is collected at bottom of condenser. Ethanol from Bassia latifolla flowers can be use as alternative fuel pure ethanol and blending with gasoline and diesel can be use as a fuel in cars and transportations. From 1 kg of Bassia latifolla flowers 0.5 lit. of ethanol can be produced.

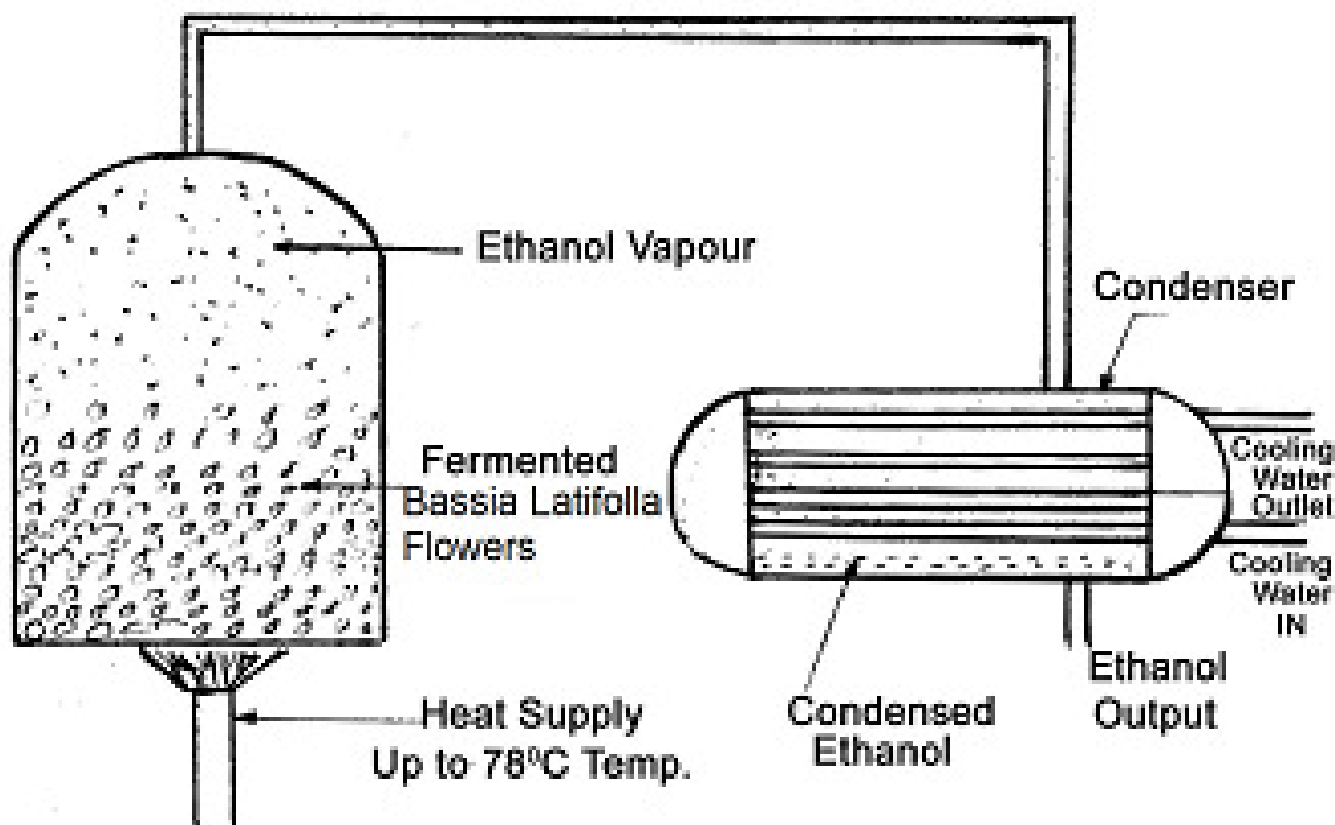
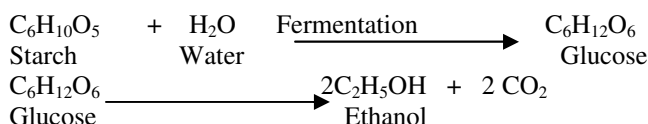


Figure-1  
 Production of Ethanol from Bassia Latifolla Flowers

### Productivity of Ethanol from Various Feedstock's

Presently production of ethanol in the united state is about 4 billion gallons annually and is an important component of the motor fuel supply. Production of ethanol in 2005 almost 5 billion gallons were produced in Brazil to be used in ethanol power vehicle in our country the production of ethanol is very less. Ethanol can be produced in different ways using a variety of feed stocks. Ethanol can be produced from sorghum, Sugarcane, grapes, corn, citrus by products and Bassia latifolla flowers<sup>12</sup>. The table shows the cost and productivity of ethanol from various sources.

**Table-1**  
**Ethanol cost and Productivity for selected feedstock**

Feedstock	Productivity Lit./ton	Cost Rs. /Lit.
Bassia latifolla Flowers	300	40.00
Corn	300	24.33
Citrus Molasses	400	33.70
Sugarcane	40	24.33
Sorghum	200	26.52

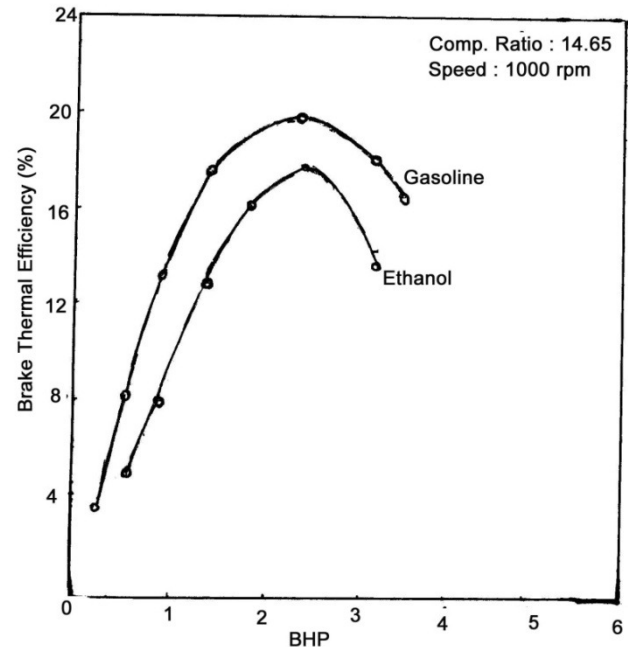
**Reliability of Ethanol as an Alternative Fuel:** i. It can be combined with gasoline in any concentration up to pure ethanol Blended with gasoline in varying quantities to reduce the consumption of petroleum fuels. ii. Flexible Fuel vehicles however are tuned to give the same output with either gasoline or hydrated ethanol. iii. It is a sustainable energy source that offers environment and long term economic advantage over fossil fuels like gasoline or diesel. iv. It can be produced from a variety of feedstocks such as corn, sugarcane, sorghum, grapes, citrus, molasses and Bassia latifolla flowers. v. Ethanol higher octane allows an increase of an engine compression ratio for increased thermal efficiency. vi. Compared with conventional unleaded gasoline, ethanol is a particulate free burning fuel sources that combust cleanly with oxygen to form carbon dioxide and water<sup>13</sup>. vii. Ethanol is considered renewable because it is primarily the result of conversion of the sun's energy into usable energy. viii. Only about 5% of the fossil energy required to produce ethanol from feedstock. ix. Use of ethanol produced from current method emits a similar amount of carbon dioxide but loss carbon monoxide than gasoline. x. Cost of ethanol per liter is less than gasoline<sup>14</sup>. xi. It can be use as a transportation fuel<sup>15</sup>.

**Performance evolution of engine:** Figure 2 and figure 3 shows Variation of Thermal Efficiency and SFC with Brake power. Performance of Engine with Gasoline and Ethanol.

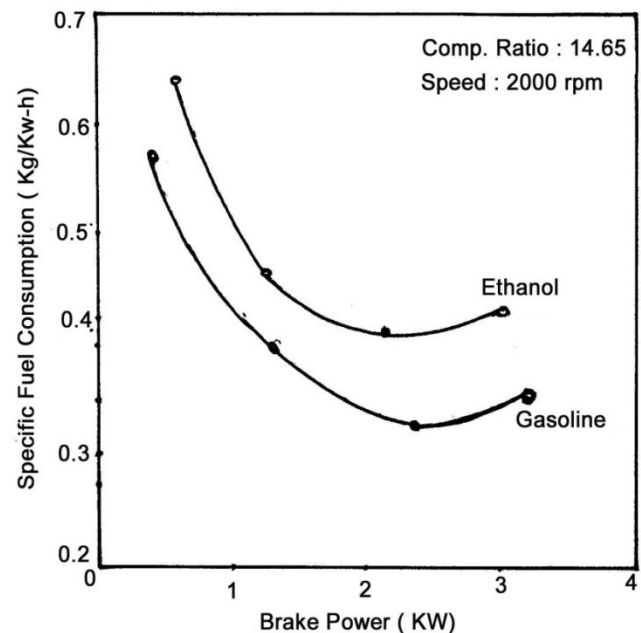
### Conclusion

Bassia latifolla flowers have good potential as a raw material for production of ethanol. Use of Bassia latifolla flowers for ethanol production which help villagers for getting self employment. Ethanol producing companies, research institution and

government can coordinates with villagers to strategically develop value added utilization of Bassia latifolla flower. Increase of ethanol production may reduce the imports of oil. Production of ethanol as an alternative fuel will create employment in rural area and alternative coming source for the farmers. In this way government can solve the problems of farmers.



**Figure-2**  
**Variation of Thermal Efficiency with BHP Variation of SFC with Brake Power**



**Figure-3**  
**Variation of SFC with Brake Power**

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