

## Mahua Seed Decorticator- Make Life Easy for Tribal People

**Mohammad Azam<sup>1\*</sup> and  
Sheela Pandey<sup>2</sup>**

<sup>1</sup>Researcher, Patalkot Tribe  
Solutions, LLP, Chhindwara  
(MP)-480001

<sup>2</sup>Associate Professor,  
Department of Post Harvest  
Process and Food Engineering,  
Jawaharlal Nehru Agricultural  
University, Jabalpur (MP)-  
482004



\*Corresponding Author

**Mohammad Azam\***

E-mail: mazam226@gmail.com

### Article History

Received: 9. 03.2021

Revised: 14. 03.2021

Accepted: 19. 03.2021

### INTRODUCTION

*Madhuca longifolia*, commonly known as mahua belongs to Sapotaceae family, which is extensively grown in central and southern parts of India. A dry deciduous tree, mahua, is largely concentrated in forest ranges of Madhya Pradesh, Jharkhand, Chhattisgarh, Odisha, Maharashtra and Bihar. This survival tree has economic, cultural and geographical importance and dominates farm economy, as it is an important source of livelihoods to forest dwellers. The annual production of seed in the country is around 0.50 million tons (Gupta et. al., 2013). Tribal communities such as Gond and Baiga tribes in Madhya Pradesh collect mahua flowers, fruits, seeds and leaves during February to April months for their economic importance. The mahua seeds, generally ellipsoidal shaped, measuring from 1.5–2.0 cm in length and from 1.3–1.6 cm across, are valued for their quantity of fat (upto 50%). Commercially known as mahua butter or mowrah butter, it has many edible and medicinal applications. The removal of rind from mahua seed manually is laborious and time consuming.

People are removed rind form seed by heavy stone and there are not used any machine to remove rind from seed. To overcome this problem of tribal people ‘Patalkot Tribe Solutions LLP’ is developed a machine, Mahua Seed Decorticator (manual cum power operated) which can be easily removed rind form seeds. A mahua seed decorticator was developed based on physical and mechanical properties of mahua seed. A decorticator is a machine for stripping the skin off bark, wood, nuts, grain, plant sheller etc. in preparation for further processing. The developed machine is designed to run by manpower (manually operated) or power operated (1 hp electric ac motor) which can be suitable for rural areas.



**Picture1 and 2: Peoples are involved removing rind from seed manually.**

This decorticator is used to decorticate mahua seed to get kernels. These kernels are processed for extraction of oil. This machine is very useful for rural people, farmers and small-scale industries for post harvest processing of mahua seeds. The unit cost of machine is 6000/- (manually).

#### Design consideration

The mechanics of mahua seed decorticator include compression, shearing and impact force. The developed machine utilizes the principle of shearing force. The following factors were considered in the design of the mahua seed decorticator.

- i. Materials of adequate strength and stability were used for fabrication (i.e. mild steel).
- ii. The machine was designed to have a maximum capacity of 40 kg of Mahua seed hour with motor operation and 20 kg per hour with manually operation so that machine could be affordable for small scale farmers and micro-industries.
- iii. The materials that are available locally were used in fabrication of the components.

The machine was conceived as an easy-to-adjust, easy-to-dismantle and easy-to-fabricate device. Consideration was given to the cost of items and materials for fabrication with the

ultimate aim of utilizing the cheapest available materials, yet satisfying all strength requirements.

#### Technical Description

- The machine is put on and made to run, before loading with the seed so as to ensure that all the component of the machine are properly fixed (if not properly fixed, there will be noise as a result of vibration).

Mahua seeds are fed manually into open hopper. Due to the vibration of the machine, the seeds gravitate down the slanted sheet to the opening into the decorticating chamber.

- In the decorticating chamber, the rotating embossed perforated drum rotates, which compress the mahua seeds against an attached stationary embossed concave perforated plate.
- The rotating drum is powered by 1 hp ac electric motor or manually. This compression force helps the frangible seed coat to crack.
- Due to continuous rotating action, the blades create impact and shearing force inside chamber, which caused the cracked the seed coat to break and detached from the kernel.



**Picture 3: Mahua Seed Decorticator**

- The clearance between the drum and concave plate are adjustable to suit the axial dimension of the seed in order to ensure efficient cracking and detachment of seed coat in a single pass. The machine has single chute.

- The efficiency of machine is reported 88% with 4-5% seed broken.

### CONCLUSION

Mahua seed is one of the important tree born oil seed. It is mainly processed for extraction of its oil. A manual cum power operated mahua seed decorticator was designed, constructed and tested. The tests carried out on the machine indicate a fairly satisfactory performance. It should be possible to improve the performance of the machine, especially with respect to throughput and percentage of completely decorticated seeds, with further modification and testing.

### Acknowledgements

We are thankful to Jawahar-RABI, IABM, JNKVV, Jabalpur, M.P. and Rashtriya Krishi Vikas Yojana-Remunerative Approaches for Agriculture & Allied Sector Rejuvenation (RKVY-RAFTAR), Ministry of Agriculture & Farmers Welfare, Government of India for technical and funding support.

### REFERENCES

- Gupta, A., Kumar, A., Sharma S., & Vijay, V. K. (2013). Comparative evaluation of raw and detoxified mahua seed cake for biogas production. *Applied Energy*. 102, 1514-1521.