

## **DEVELOPMENT AND PERFORMANCE EVALUATION OF NUT CRACKING MACHINE FOR KOTTAMBA (*Terminalia catappa*)**

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Kottamba (*Terminalia catappa*) is an underutilized crop which belongs to Combretaceae family maintained as an ornamental tree. There is no efficient method to crack kottamba in Sri Lanka, other than the manual cracking with a stone. The adoption of manual cracking method results in damages of nuts with high risk of injuries to labourers. This study was aimed to develop a manually operated kottamba cracking machine. Major components of the kottamba nut cracking machine are electric motor, conveyor belt, fruit holders and impact hammer. The kottamba nut cracking machine works on the principle of; (i) conversion of electrical energy from the electric motor into mechanical energy and (ii) conversion of angular motion into linear motion through a crank shaft. The power is transmitted to the crank shaft from the electric motor, using a belt and pulleys. Rotating crank shaft moves the hammer up and down to apply an impact on the kottamba fruit. The belt conveyor carries individual kottamba fruits with the aid of fruit holders. Fruit holders facilitate the holding of nuts, based on the characteristics of the husk. After crushing, the fruits are removed from the holder with the aid of the collecting peg. The kottamba nut cracking machine is safe to use and easy to operate. At the performance evaluation of the machine it was realized that damages caused to fruits and the operator were negligible. Machine weighs 62.5 kg and total production cost of the machine was Rs. 35,000. Performance of the machine were compared with manual cracking. Actual capacities of manual and mechanical cracking were 619 and 639 nuts/h, respectively and theoretical capacities were 1,125 and 1,058 nuts/h respectively. The comparative figures of manual and mechanical cracking for field efficiencies were 55% and 60%, respectively. Therefore, kottamba nut cracking machine could be effectively utilized for better results than manual cracking.

**Keywords:** Cracking machine, Kottamba, Performance evaluation