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Optimisation of Mechanical Oil Extraction from Husked Kernels of *Jatropha curcas* L. Using Matrix Additives

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Abstract

The need of renewable fuels produced from various plants is increasing significantly nowadays. *Jatropha curcas* L. is an important plant potential source for biofuel production. The plant is used by various industries as raw material for biodiesel production. However, the mechanical extraction efficiency should be increased because the kernels are husked and this fiber is decreasing the quality of feed from detoxified press cake. In order to facilitate the process of mechanical oil extraction and improve feed quality, an addition and optimisation of matrix material in feedstock is necessary. As for the additives, cellulose is considered to be one of the prospective additives, because it increases fiber contents which later on, will increase the efficiency of the oil extraction. In this study, three different types of additives are selected such as corn, wheat and triticale. The objective of this study was the investigation performance of the additives in oil extraction from *Jatropha* kernel. Therefore, the additive type and amount are selected to be the main variable parameters. The experiments were conducted using mechanical screw press type – Komet D85-1G. With respect to the physical properties of the machine, another four processing factors are also determined; screw press (16 and 21.5 mm choke ring size), press cylinders (1 and 1.5 mm bore size), nozzles (8, 10 and 12 mm nozzle diameter), and rotational speed (220, 290, and 355 rpm). It is expected that the addition of additives such as corn, wheat or triticale will provide structure and strength for improving the extraction process with better oil recovery value.

Keywords: Additives, *Jatropha curcas*, matrix pressing, oil extraction, physic nut