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Optimization and computational evaluation of mechanical juice extraction from Cassava (*Manihot esculenta* C.) leaves

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Cassava ranks as world's fourth most important crop grown in 105 countries mainly for starchy roots and a staple food for nearly one billion people. Cassava leaves rich in protein (17.7-38.1% dry matter basis) have a major share in 100 million tones cassava residue per year. Cassava leaves can be an economical and sustainable source of protein after suitable processing. In the present study, optimization and computational evaluation were made on the mechanical juice extraction from cassava leaves. The influence of input variables such as nozzle diameter 4, 5 and 6 mm, rotational speed of screw press from 18 to 40 rpm were investigated in relation to process efficiency. Higher extraction efficiency was observed with lower motor speed and smaller nozzle diameter. 4 mm nozzle diameter and 18 rpm screw press were found to be the optimal conditions for highest efficiency (89.3%). Under these optimized conditions, the average temperature of the press cylinder, press head and juice at steady-state conditions were 31.0, 45.4 & 26.8° C, respectively. The flow behaviour of the optimized conditions was simulated under laminar model of non-Newtonian fluid by following Navier-Stokes formulation. The velocity and pressure was estimated at 0.027 m/s and 5.23 bars. This information can be used to develop optimum model of pressing machines for cassava leaves.

Biography

Sajid Latif is a researcher at the Universität Hohenheim, Germany.

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