

Harnessing the Potential of Oilcane Waste Mud for Recovering Biobased Waxes

Background/Objective

Oilcane is an engineered sugarcane with the ability to hyper-accumulate vegetative lipids. Oilcane juice and bagasse have been evaluated as potential substrates for producing fuels and chemicals. The juice contains solid particles that are separated as “waste mud,” the disposal of which is a major issue, and its valorization would contribute to complete utilization of this bioenergy crop. Here, we examined the valorization of oilcane waste mud for recovering waxes as a part of a biorefinery portfolio.

Approach

Hexane and ethyl acetate were tested as extracting solvents. The recovered waxes were purified, and their chemical and thermal profiles were compared with those of commercial natural waxes such as carnauba wax and beeswax.

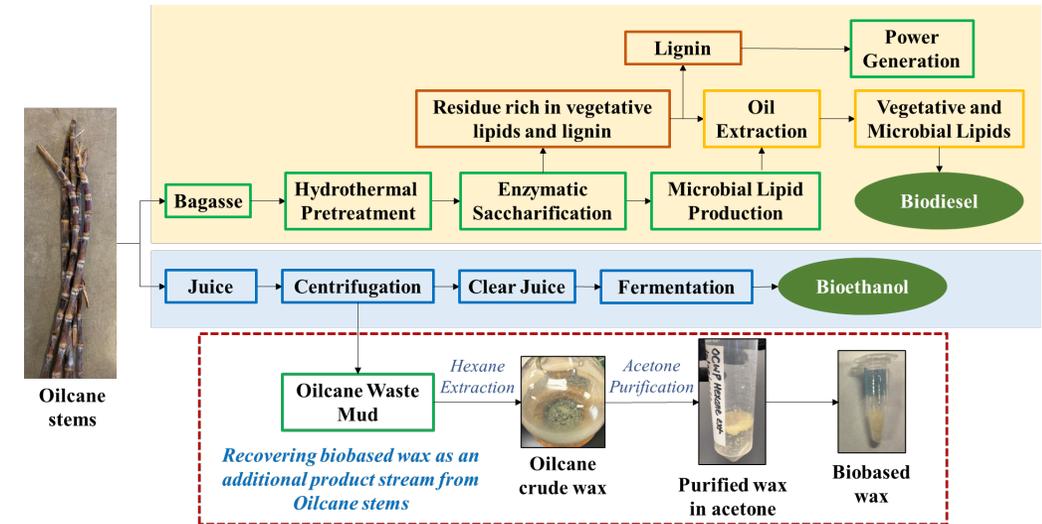
Results

A crude wax yield of $25.6 \pm 0.2\%$ (w/w) was obtained using hexane and achieved a relative purification of $64.5 \pm 1.2\%$ and so could potentially produce 13.5 kg (dry basis) of crude wax and 9 kg (dry basis) of purified wax per 1000 L of juice. The purified wax had a melting point of 74.7°C . Thermal and chemical profiles of some oilcane wax samples were similar to carnauba wax, making it a viable substitute.

Significance/Impacts

This study demonstrates the potential of oilcane waste mud as a source of natural wax in a zero-waste biorefinery that would also help reduce dependence on petroleum-derived waxes.

Banerjee et al. 2024. “Harnessing the Potential of Oilcane Waste Mud for Recovering Biobased Waxes.” *Journal of the American Oil Chemists’ Society*. DOI: 10.1002/aocs.12844.



Recovering biobased wax from oilcane waste mud as an additional product stream in a biorefinery approach.