The objective of this research was to find a way to decrease the cost of composites that are made out of modified vegetable oil resins. Leaves are being investigated in this work as potential fillers due to their abundance and low (non-existent) cost, with the objective of producing composites with acceptable mechanical properties and higher percentage of renewable resource. The US alone collects 30 million tons of leaves every year as waste.

Dewaxing
- Boiling water
- Boiling water – γ-MPS
- Benzene-Ethanol – γ-MPS
- Carbonized leaves

215°C (25°C for 3 hrs - 215°C for 12 hrs)

450°C (25°C for 3 hrs - 215°C for 12 hrs/450°C for 1 hr)

CB4 was mixed with leaves that were treated with Boiling water, Boiling and γ-MPS, Benzene-Ethanol and γ-MPS, and carbonized leaves to 215°C and 450°C.

CB5 was mixed with leaves that were treated with Boiling water, Boiling and γ-MPS, Benzene-Ethanol and γ-MPS.

We were able to obtain composites that had good properties employing bio-based resins and treated leaves.

The composites prepared with natural resins and treated leaves with boiling water and γ-MPS gave the best mechanical properties.

CONCLUSION

We were able to obtain composites that had good properties employing bio-based resins and treated leaves. Nonetheless other methods of removing the wax are being explored, 5% and 2% of strong detergent at 80°C are the best treatments so far for removing the wax.

ACKNOWLEDGEMENTS

This work is supported by the Army Research Laboratory through the Composite Materials Technology program.