

## **Preliminary Study on Utilization of Coconut Spathe as a Carbon Source for Electrode Fabrication of Supercapacitors**

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### **1. ABSTRACT**

Rising energy needs, fueled by the increasing use of electric technologies and advanced energy systems, emphasize the critical necessity for effective solutions for storing energy efficiently. Supercapacitors, with their rapid charge/discharge rates and high stability, play a pivotal role in addressing this growing demand. This study specifically focuses on exploring the potential of coconut spathe as a cost-effective carbon source for supercapacitor electrodes. Carbon electrodes were fabricated using non-activated carbon of coconut spathe and demonstrated promising electrochemical performance in both Cyclic Voltammetry and Electrochemical Impedance Spectroscopy Tests. Specifically, the specific capacitance reached  $3.12 \text{ mFg}^{-1}$ , with an energy density of  $0.433 \text{ mWhkg}^{-1}$  at a scan rate of  $100 \text{ mVs}^{-1}$ . The research suggests the potential for the application of coconut spathe-derived carbon in energy storage systems, with future work focused on enhancing conductivity and porous characteristics.

**Keywords:** Coconut spathe, Supercapacitor electrodes, Energy storage

*Editorial Note: The full paper of this work is transferred to the Sri Lanka Journal of Physics.*