

**Influence of carbonization temperature on physicochemical properties of biochar derived from slow pyrolysis of durian wood (*durio zibethinus*) sawdust**

**Abstract**

The objective of this study was to explore the influence of pyrolysis temperature on the physicochemical properties of biochar synthesized from durian wood (*Durio zibethinus*) sawdust. Surface morphological features, including the porosity and BET surface area of biochars, provide appropriate dimensions for growing clusters of microorganisms with excellent water retention capacity in soil. Oxygen-containing surface functional groups play a vital role in improving soil fertility by increasing its cation and anion exchange capacities with reduced leaching of nutrients from the soil surface. Biochar was produced via slow pyrolysis of woody biomass (WS) using a fixed bed reactor under an oxygen-free atmosphere at different pyrolysis temperatures (350, 450, and 550 °C). The biochars obtained were characterized using ultimate and proximate analyses, Brunauer-Emmett-Teller (BET) surface area, field-emission scanning electron microscopy (FE-SEM), Fourier transform infrared spectroscopy (FTIR), and X-ray diffraction (XRD). The yield of biochar decreased from 66.46 to 24.56%, whereas the BET surface area increased sharply from 2.567 to 220.989 m<sup>2</sup>/g, when the pyrolysis temperature was increased from 350 to 550 °C. The results highlighted the effect of pyrolysis temperature on the structure of the biochar, which could be advantageous for agricultural industries.