

SUPPLEMENTARY MATERIAL TO
**Effect of pyrolysis temperature and time of Robusta coffee husk on
yield and product characteristics**

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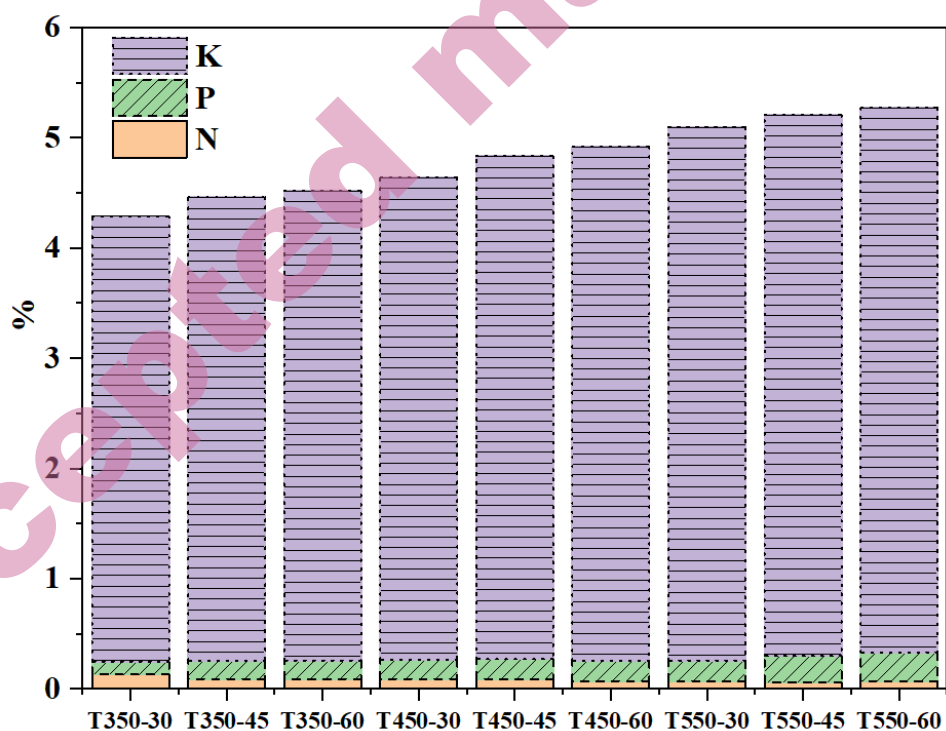


Fig. S1. Biochar's total nitrogen, phosphorus, and potassium content at different pyrolysis temperatures and times

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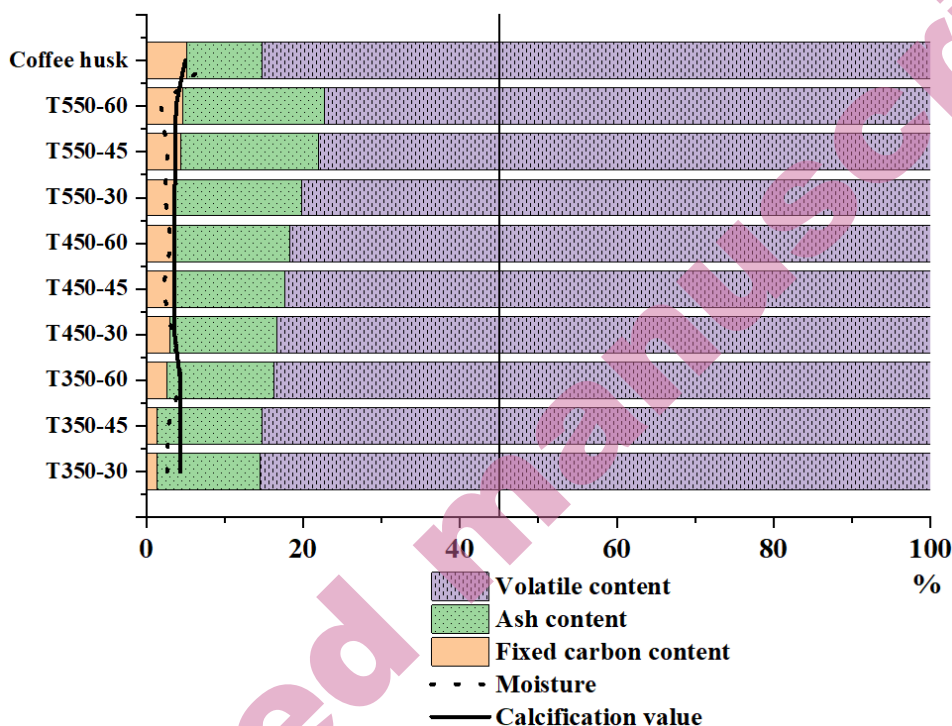


Fig. S2. The average physicochemical characteristics of coffee husks and biochar from coffee husks at different pyrolysis temperatures and times

Table S1. Functional groups in the FTIR spectrum

| Wavelength, cm^{-1} | Functional groups |
|------------------------------|--|
| 3400-3700 | Vibrations of -OH bonds from H_2O , phenol, and organic acids. ⁴⁴ |
| 2850-2950 | Vibrations of the stretched C-H bond of aliphatic CH_x . ^{44,45} |
| 1700-1750 | Vibrations of C=C bonds of aromatic and olefinic rings. ^{44,46} |
| 1600-1650 | Vibrations of C=C bonds of lignin and hemicellulose. ^{44,45} |
| | Vibrations of C=O bonds of amide (I), ketones and chinons. ^{44,45} |
| 1500-1590 | Oscillation of the asymmetric COO- bond. ⁴⁶ |
| 1400-1460 | C-H change of CH_3 group. ⁴⁷ |
| 1200-1270 | Phenolic -OH group. ²⁴ |
| 1000-1110 | Symmetric elongation of C-O-C in ester groups of cellulose, hemicellulose, and methoxyl groups of lignin. ^{44,45} |
| 460-990 | Vibration of Si-O bond. ⁴⁵ |