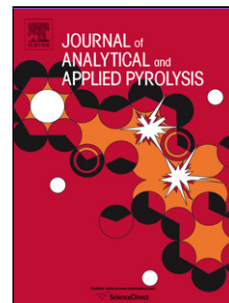


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# Characteristics and inorganic N holding ability of biochar derived from the pyrolysis of agricultural and forestal residues in the southern China

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## Highlights:

- Compared to pyrolysis temperature feedstock types has obviously effects on biochar physical properties and inorganic N holding ability.
- High pyrolysis temperature significantly enhanced CEC,pH,C and organic matter content but decreased nutrient element content.
- Biochar derived from banana biomasses had great N holding ability, the max absorption content of  $\text{NO}_3^-$ -N and  $\text{NH}_4^+$ -N was 153.06-2342.27mg.kg-1 and 609.59-1490.62 mg.kg-1 respectively.
- All 24 biochar products had very good absorption of  $\text{NH}_4^+$  from 554.01-1860.02 mg.kg-1.

## Abstract

Biochar not only provides an important way to utilize agricultural and forestry waste, but also plays an important role in soil improvement and soil carbon sequestration. This study mainly investigated the effect of pyrolysis temperatures(300, 500 and 650 °C) and feedstock types including Banana Leaf (BL), Banana Stalk (BS), Banana Pseudo stem (BP), Sugarcane Leaf (SL), Sugarcane Stalk (SS), Cassava Stem (CS), Mulberry Stalk (MS), and Eucalyptus Branches (EB) on the biochar properties an its inorganic N holding ability. The results showed that the physical properties of biochar were more affected by agricultural and forestal residues types e.g; herbaceous feedstock materials resulted in lower surface area (2-70 m<sup>2</sup>/g) while woody materials obtained relatively higher surface area (200-380 m<sup>2</sup>/g). However, the chemical properties of biochar were affected by pyrolysis temperature, as results indicated that BL biochar obtained pH 10.0 at 650 °C, while 8.45 at 300 °C,

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