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## Fabrication of biochars obtained from valorization of biowaste and evaluation of its physicochemical properties

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### Abstract:

This study investigated the yields and the physicochemical properties of biochar from three different feedstocks viz., i) bioenergy byproducts (deoiled cakes of *Jatropha carcus* and *Pongamia glabra*), ii) lignocellulose biomass (*Jatropha carcus* seed cover), and iii) a noxious weed (*Parthenium hysterophorus*), obtained through slow pyrolysis at a heating rate of 40°C min<sup>-1</sup> with a nitrogen flow 100 mlmin<sup>-1</sup> at a temperature range of 350–650°C. For successful utilization of biochar for C-sequestration, its ability to resist abiotic or biotic degradation was deduced from recalcitrance index R<sub>50</sub> by using TG analysis. It was observed that the biochar produced at higher temperature had higher water holding capacity (WHC) and pH, suggesting its suitability as an amendment in soil with low water retention capacity; thus biochar may be designed to selectively improve soil chemical and physical properties by altering feedstocks and pyrolysis conditions. Biochar produced at 650°C had highest yield in the range of 28.52-39.9 wt.%.

Keywords: *Biochar, Pyrolysis, C-sequestration potential, Water Holding Capacity, recalcitrance.*

### 1. Introduction

An estimate of 500-550Mt of crop residue mostly as a wastes is generated each year in India (IARI, 2012). The gravity of the situation demands the management of wastes in such a

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