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Influence of biochar on Chinese cabbage (*Brassica rapa* L.) and wheat (*Triticum aestivum* L.) seeds germination with Cd(II) in water

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The biochars were derived from *Gossypium barbadense* straw, *Z. mays* straw and pig manure through pyrolysis at temperatures 300°C and 500°C under limited oxygen condition. The influences of the biochars on seed germination and early seedling growth of Chinese cabbage (*Brassica rapa* L.) and wheat (*Triticum aestivum* L.) in the aqueous solutions containing Cd(II) were evaluated under laboratory conditions. The research comprised 4 amount rates (0, 0.5%, 1% and 2%/glass) of 6 types of biochars. Cd(II) was added as chloride salt in solution in concentration 10 mg/L. The results of sowing seeds showed that addition of biochar changed such characteristics as pH, electroconductivity (EC), availability of ammonium and Cd(II). It was determined that germination and root length had been decreased with higher amount of biochar, at the same time lower amount showed increase. A large amount of biochar (2%/glass) had negative effect on the root length of *Brassica rapa* L. and *Triticum aestivum* L. while fewer biochar (0.5 g/glass) indicated a better result, increased or no effect. The percentage of germination did not show regularity. Pearson's correlation coefficient showed association between pH and Chinese cabbage germination and root length had weak positive relationship ($0.2 < r > 0.29$), between EC and Cd(II) and root length and germination of both seeds had strong positive relationship ($0.40 < r > 0.69$), another all had no or had negligible relationship ($0 < r > 1.9$).

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