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| Title | Microbial Abundance of Waste Derived Biochar Incubated Acid Soil in Bangladesh | | |
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| Abstract |  |
| Due to climate change biochar is recently recommended as a control approach to increase crop productivity and global warming reduction. As biochar application changes the soil pH towards alkalinity, this effects acid soils nutrient cycles the same as microbial abundance. This research was conducted to investigate the microbial abundance as affected by waste-derived biochar application in two different rates on acidic soil of Bangladesh. Slow pyrolyzed (500±50ºC) different waste-derived biochars viz. sewage sludge, sugarcane bagasse, potato peels, water hyacinth, and organic waste were applied at 10 tons ha-1 and 15 tons ha-1 on the acidic soil. An in-vitro incubation study was conducted on experimental soil applying all the biochar to understand how nutrient availability and carbon dynamics affect the microbial abundance of the acid soil. The incubation study was divided into two stages: submerged condition (up to 60 days) followed by a dry condition (61 to 120 days) and biochars were applied in two different rates such as 10 and 15 tons ha-1. The viable count of bacteria significantly (P<0.05) increased with the variation of incubation periods and soil moisture content, although the rates did not make any difference. The beneficial Rhizobium spp. bacteria count ranged from 4.21 to 6.47 log CFU/g; Azotobacter spp. count ranged from 2.33 to 5.60 log CFU/g and Phosphate Solubilizing Bacterial count ranged from 2.30 to 3.74 log CFU/g. However, no sign of coliform bacteria or Escherichia coli was found in any sample, but also none of the biochar amended soil samples possessed Pseudomonas spp. and Trichoderma spp. In outcome, the waste-derived biochars treatments showed an insignificant impact on microbial parameters over the first 2 months after biochar incorporation which progressively increased with the course of time and the presence of oxygen. | |

**Please specify which Sustainable Development Goal (SDG) (s) falls under your research:**

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| Goal 1 | No Poverty | Goal 2 | Zero Hunger |
| Goal 3 | Good Health and Well-Being | Goal 4 | Quality Education |
| Goal 5 | Gender Equality | Goal 6 | Clean Water and Sanitation |
| Goal 7 | Affordable and Clean Energy | **Goal 8** | **Decent Work and Economic Growth** |
| Goal 9 | Industry, Innovation and Infrastructure | Goal 10 | Reduced Inequalities |
| Goal 11 | Sustainable Cities and Communities | Goal 12 | Responsible Consumption and Production |
| Goal 13 | Climate Action | Goal 14 | Life below Water |
| Goal 15 | Life on Land | Goal 16 | Peace, Justice and Strong Institutions |
| Goal 17 | Partnerships for the Goals |  |  |