

添加不同溫度製備生物炭對土壤團粒穩定度的影響

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摘要 生物炭(biochar)添加近年來已被認為可有效改善土壤品質。本研究主要以一泥岩土壤為研究對象，分別添加 2.5%、5%、10% (w/w)之 400°C 及 700°C 厭氧熱裂解製成之稻殼炭，於田間容水量下培育 21 周。以濕篩法分離不同粒徑之團粒，並計算各處理之團粒平均重量直徑 (Mean weight diameter, MWD)以評估不同溫度製備之稻殼炭及不同添加量對土壤團粒穩定度之影響。試驗結果顯示，未添加稻殼炭處理(控制組)之 MWD 為 1.15 mm，而添加 2.5%、5% 及 10% 之 400°C 稻殼炭之團粒粒徑則分別為 1.67 mm、1.74 mm 及 2.09 mm；與對照組相較下，團粒粒徑分別增加 51%、45% 及 81%。此外，添加 2.5%、5% 及 10% 之 700°C 稻殼炭之團粒粒徑分別增加 28%、24% 及 91%。此結果顯示，添加稻殼炭可顯著($p < 0.05$)改善泥岩土壤之團粒穩定度，且隨施用量增加而增加，以添加 400°C 稻殼炭最能增加團粒粒徑。

關鍵詞：泥岩土壤、稻殼炭、團粒穩定度。

Effects of Rice Hull Biochar Pyrolyzed by Different Temperatures on Soil Aggregate Stability

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ABSTRACT Biochar has been considered to improve soil quality effectively. This study incorporated rice hull biochars, which were pyrolyzed by 400°C (RHB-400) and 700°C (RHB-700), into a mudstone soil by application rates of 2.5%, 5% and 10% (w/w). The amended soils were wet-sieved to separate different sizes of soil aggregates and calculate mean weight diameter (MWD) to evaluate aggregate stability after 21 weeks. The results indicated that MWD of the RHB-400 treatments were 1.67 mm, 1.74 mm and 2.09 mm for 2.5%, 5% and 10%, respectively, which were increased by 51%, 45% and 81% as compared with the control. Besides, the MWD of the RHB-700 treatments were increased by 28%, 24% and 91% as compared with the control. The RHB-400 seems to be a better amendment to facilitate formation of macro-aggregates rather than the RHB-700.

Key Words : Mudstone soil, rice hull biochar, soil aggregate stability.

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