

Abstract No. 17**Electrochemical properties and pore water nutrient contents of organic amended submerged sub-tropical soils**

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Abstract The quality and quantity of carbon in different organic sources may influence the redox chemistry of soil which in turn affects the nutrient availability. However, little is known for such amendments in paddy soils. Thus, a 14 weeks anaerobic incubation at 250 °C was carried out to observe the evolution of electrochemical properties (pH and Eh) and pore water nutrient contents (N and P) in two contrasting (highly weathered Noadda and very young Balina soil) sub-tropical soils of Bangladesh amended with poultry manure, poultry bio-slurry, cowdung and cowdung bio-slurry @ 2% (w/w). The pore water was collected through rhizon sampler at every two weeks interval. The pH values were gradually increased to neutral while the Eh values were decreased and soil became reduced with the advancement of incubation showing a significant variation among the treatments. The highest and lowest pH values were observed in poultry bio-slurry and poultry manure treated soils, respectively when averaged over two soils. On the other hand, the most negative Eh value was observed in poultry manure amended soil followed by poultry bio-slurry, cowdung and cowdung bio-slurry amendment with the least negative in control. Significantly higher pH (6.85 vs 6.67) and lower Eh (-140 vs -106 mV) values were found in Balina compared to Noadda soil when averaged over organic amendments. The NH₄-N concentrations showed a decreasing trend as follows: poultry manure > poultry bio-slurry > cowdung > control > cowdung bio-slurry while the trend Phosphate P was as follows: poultry bio-slurry > Poultry manure > control > cowdung > cowdung bio-slurry treatments. The average NH₄-N and Phosphate P concentration of Balina soil was significantly higher over Noadda soil. Based on the present study, it may be concluded that the quality of organic materials as well as soil itself have a large influence on the changes of electrochemical properties and nutrient releases during anaerobic

Keywords Redox potential, pH, Pore water, Paddy soil, Anaerobic incubation
